

THE
VETERINARY BULLETIN

Vol. 25]

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[No. 2

DISEASES CAUSED BY BACTERIA AND FUNGI

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MURPHY, J. M. & STUART, O. M. (1954). **The individual cow as a factor in *Streptococcus agalactiae* infection artificially induced by means of the Hadley-Wisconsin swab technique.**—*Cornell Vet.* 44, 268-275. [Authors' summary modified.] 267

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SMITH, I. M., PATTISON, I. H. & HOLMAN, H. H. (1954). **The increased resistance of the udder of goats to infection with *Str. dysgalactiae* Strain 419, after vaccination with the same strain.**—*J. comp. Path.* 64, 206-212. 268

Five of ten goats, in the early stage of their

first lactation, were given a series of 6 intraperitoneal injections of a formolized vaccine of *Str. dysgalactiae* Strain 419, formolized broth being similarly administered at the same time to the other five, used as controls. Following intramammary inj. of Strain 419 of this organism into one half of the udder, the estimated loss of milk yield from that half was lower in the vaccinated group than in the control group and fewer neutrophils and bacteria were present in the milk. Crises were recorded 9 times in the control group and only once in the vaccinated group. During the second week after the intramammary challenge the milk yield from the uninfected half of the udder was higher in the vaccinated goats than in the controls.—F.E.W.

HOFF, H. & WOXHOLT, C. (1952). **Diplokokkfóringinfeksjon hos mink. [Fatal outbreak of infection in mink with *Streptococcus pneumoniae* following ingestion of meat from an infected carcass.]**—*Nord. VetMed.* 4, 1201-1206. [In Norwegian. English and German summaries.] 269

A report on an outbreak of *Streptococcus pneumoniae* type 22 infection in mink that had been fed for 2-3 days on the carcass of a calf that had died from a generalized septicæmic infection with this organism. About 86% of the mink died.—R. B. HOLCOMBE.

SCATTERDAY, J. E., STICHKA, A. W. & GALTON, M. M. (1954). **Anthrax in Florida.**—*Vet. Med.* 49, 188-190. 270

This was a note on outbreaks of anthrax in Florida and on the pertinent livestock health regulations in that State. The authors described the diagnostic procedures used.—A.S.

PAOLETTI, A. & LUIGI, T. (1954). **Riconoscimento dell'azione sporicida e batteriostatica di alcuni ammonio quaternari sul bacillo del carbonchio e sul bacillo sottile. [The bactericidal and bacteriostatic action of quaternary ammonium compounds on *B. anthracis***

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A new number of the Review Series of the Commonwealth Bureau of Animal Health has recently been published. It deals with photosensitization in diseases of domestic animals and has been prepared by N. T. Clare, M.Sc., of the Ruakura Animal Research Station, New Zealand.

The literature is reviewed and the photosensitivity diseases are classified under the heads (1) Primary; (2) Due to Aberrant Pigment Synthesis; (3) Hepatogenous; and (4) those of uncertain aetiology. Full accounts are given of the various diseases in which photosensitization occurs and the methods for investigation of this type of disease are discussed.

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by

N. T. CLARE, M.Sc.

Ruakura Animal Research Station, New Zealand

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and *B. subtilis*.]—*G. Batt. Immun.* **46**, 296-301. [English, French and German summaries.] **271**

The authors pointed out that certain quaternary ammonium compounds (β -phenoxy-ethyl-dimethyl - dodecylammonium bromide, hexadecyltrimethyl ammonium bromide, and alkyl-dimethyl-benzylammonium chloride) have a much better sporicidal and bacteriostatic action against *B. anthracis* and *B. subtilis* when they are used in broth cultures than when incorporated in agar.—I. W. JENNINGS.

FIANCETTE, M. (1952/53). De l'emploi du B.C.G. [Vaccination of cattle with B.C.G.]—*Bull Soc. Sci. vét. Lyon.* **54** & **55**, 281-283. **272**

A note along conventional lines on the use of B.C.G. vaccination in calves.—A.S.

FRITZSCHE, K. (1953). Eine Modifikation der BCG-Schutzimpfung bei Kälbern. [Vaccination of calves with B.C.G. and a modification of the tuberculin test.]—*Zbl. VetMed.* **1**, 3-24. **273**

To overcome the difficulty that calves react to the tuberculin test after inoculation with B.C.G. vaccine, F. employed a comparative i/d tuberculin test using B.C.G. tuberculin and a "purified" bovine type tuberculin.

For immunization he advocated the use of 50-100 human doses of B.C.G. vaccine. [See also *V.B.* **24**, 2201.]—W. G. SILLER.

AVELLINI, G. (1953). Comportamento del sangue periferico in bovini affetti da tubercolosi e trattati con idrazide dell'acido isonicotinico. [Behaviour of peripheral blood in tuberculous cattle after treatment with isonicotinic acid hydrazide.]—*Clin. vet. Milano.* **76**, 361-368. [English and French summaries.] **274**

Blood samples from seven cattle with advanced TB, were examined to determine the effect of iso-nicotinic acid hydrazide treatment. The main changes were leucopenia and a reduction in the number of nuclear lobules in the leucocytes, probably indicating an improvement in health. Eosinophilia was also noted, and was attributed to the destruction of tubercle bacilli by the drug, with consequent liberation of allergens.—I. W. JENNINGS.

I. SEELEMAN, M. & RACKOW, H.-G. (1953). Über die Reaktionsstärke verschiedener Tuberkuline beim Rinde. [The reaction of cattle to various types of tuberculin.]—*Rindertuberkulose.* **2**, 37-46. **275**

II. SEELEMAN, M. & RACKOW, H.-G. (1954). Weitere Versuche mit verschiedenen Tuberkulinen an Rindern. [Further experiments with different types of tuberculin in cattle.]—*Ibid.* **3**, 149-164. **276**

I. The authors compared Weybridge P.P.D. and a highly purified tuberculin of German origin with one Swiss and 2 German peptone-free "partially purified" mammalian tuberculins, in single i/d tuberculin tests of 240 cattle, the majority of which had TB. They concluded that the "partially purified" type of tuberculin was to be preferred, since, in spite of a stronger non-specific action, a positive reaction was more pronounced and there were fewer false results than with the highly purified tuberculins.

II. Using 100 cattle, the authors confirmed the results of their previous work. In addition they compared 3 peptone-free "partially purified" tuberculins, prepared according to German standards, with Weybridge P.P.D. and 2 other highly purified tuberculins of German origin. They found that the German standard tuberculins, although otherwise satisfactory and as satisfactory as the others, did not yield uniform reactions. To solve this problem of variation, they discussed the centralization of tuberculin manufacture in Germany to a single laboratory.—R.M.

DUBOSE, H. M., MASON, W. R. & CUMMINGS, M. M. (1952). Comparison of a new purified tuberculin with purified protein derivative.—*Amer. Rev. Tuberc.* **66**, 345-350. [French and Spanish summaries.] **277**

A purified tuberculoprotein fraction behaved similarly to commercial P.P.D. in tuberculous and TB-free human subjects, but proved significantly superior in detection of the allergy produced by B.C.G. vaccination.

—A. B. PATERSON.

PLATT, H. (1954). Observations on the systemic tuberculin reaction in the tuberculous guinea pig.—*J. comp. Path.* **64**, 312-334. [Author's conclusions modified.] **278**

The systemic tuberculin reaction in the tuberculous g. pig may assume either of two principal forms:— (a) a transitory febrile reaction which disappears after some hours, leaving the animal quite normal again; (b) tuberculin shock characterised either by a preliminary temperature rise, followed by falling temperature, circulatory collapse and death 4 to 30 hours after injection or in occasional animals a very mild non-fatal form of shock.

When a standard dose of P.P.D. is injected into tuberculous g. pigs in the early stages of

T.B., it gives rise to the febrile type of response; when injected in the later stages of infection it gives rise to tuberculin shock. The dose of P.P.D. necessary to produce shock decreases as infection progresses. P.P.D. in tuberculous g. pigs causes a marked leucopenia, most intense 4 hours after injection; the lymphocytes and monocytes remain depleted in numbers for rather longer than the neutrophils. P.P.D. also caused a considerable outpouring of immature neutrophils into the circulation within 1 to 4 hours.

At autopsy, focal and confluent haemorrhages and congestion in the liver, spleen and sometimes other organs are characteristic of the shock type of systemic reaction. They are usually absent after febrile responses. Haemorrhagic changes in the adrenal glands occur after both forms of reaction, but more often after the latter. Both the febrile and the shock forms of reaction appear to be clinical expressions of cellular damage, differing quantitatively in intensity. It was not possible to demonstrate a release of histamine from the isolated lungs of g. pigs when perfused with solutions of P.P.D.

I. SANDERS, A. G., DODSON, L. F. & FLOREY, H. W. (1954). **An improved method for the production of tubercles in a chamber in the rabbit's ear.**—*Brit. J. exp. Path.* **35**, 331-337. 279

II. DODSON, L. F., SANDERS, A. G. & FLOREY, H. W. (1954). **Observations on tuberculous lesions in a transparent chamber in the rabbit's ear.**—*Ibid.* 338-344. 280

I. An account of a technique whereby tissue already established in a methyl methacrylate resin chamber in the rabbit's ear as described by Ebert, Florey and Pullinger (1939) can be infected with tubercle bacilli with very little trauma.

II. The authors described the development of T.B. in a transparent chamber [see I *supra*] in the rabbit's ear. Histiocytes of the connective tissue apparently play no part in the formation of a tubercle. Vital dyes enter tubercles at an early stage. They are taken up by macrophages at the edge of the lesions. Cutaneous tuberculin reactions were infrequent and irregular in animals with mature tubercles in the ear chamber. A focal tuberculin reaction could, however, be elicited by i/v injection, and this occurred on several occasions in the absence of a cutaneous reaction.—F.E.W.

BASSERMANN, F. J. (1953). **Probleme der Morphologie, Cytochemie und Wuchsform des**

Tuberkuloseerregers. [**Morphology and cytochemistry of *Mycobacterium tuberculosis* in young cultures.**] pp. 98. Stuttgart: G. Thieme. DM 7.80. 281

The purpose of this work is to acquaint the reader with some of the problems and phenomena encountered in research on the tubercle bacillus, including some of those to which, so far, no adequate explanation has been found, or on which there are controversial opinions, e.g. filtrable forms, developmental cycles, acid-, alkali-, and alcohol-fastness, etc. The subject matter is divided into sections headed: nomenclature and classification; morphology of the tubercle bacillus; organization of the bacterial cytoplasm; granular forms; hyphae and mycelium formation; multiplication; filtrable forms; genetics. Although paper-bound the booklet is well produced. There are a large number of references. There are 40 illustrations, mostly photomicrographs.—E.G.

MEYNELL, G. G. (1954). **The antigenic structure of *Mycobacterium tuberculosis* var. *hominis*.**—*J. Path. Bact.* **67**, 137-150. [Abst. from author's summary.] 282

Polysaccharide and protein antigens present in P.P.D. tuberculin can be separated by adsorbing the polysaccharides on normal sheep r.b.c. and the proteins on r.b.c. that have previously been tanned by the method described by Boyden [*V.B.* **21**, 3620].

Two other preparations of tuberculo-polysaccharide had less power than P.P.D. to sensitize normal r.b.c.

The injection of living or dead tubercle bacilli into rabbits readily produced anti-polysaccharide antibodies: anti-protein antibodies were produced only after the intramuscular injection of either P.P.D. or large numbers of killed bacilli suspended in paraffin.

Bacillary suspensions combined with the anti-polysaccharide antibody and also with the antibody for "l'antigène méthylique" of Nègre and Boquet, a preparation of tuberculo-phosphatide, but not with the anti-protein antibody. M. suggested that the tubercle bacillus has polysaccharide and phosphatide surface antigens, and that the protein present in P.P.D., and also found in the bacillary bodies, is a deep antigen.

Only human and bovine types of tubercle bacilli combined with the anti-polysaccharide antibody in the sera of rabbits infected with the human type bacillus; avian type, saprophytic strains and strains from cold-blooded animals did not absorb this antibody.

HNATKO, S. I. (1954). The investigation of soil for bacteriophages against pathogenic and saprophytic acid-fast micro-organisms.—*Canad. J. publ. Hlth.* 45, 70-72. [Author's summary modified.] 283

Bacteriophages for *Mycobacterium ranae* and *M. eos* were isolated from samples of "dung soil" by specific enrichment with a heavy suspension of each organism. The method of enrichment was not found suitable for isolating bacteriophages for pathogenic acid-fast micro-organisms. *M. ranae* phage was active against 3 strains and *M. eos* phage against 2 of 40 saprophytic strains tested. Neither was active against pathogenic tubercle bacilli. The author considered that these two bacteriophages may prove of value in the classification of the genus *Mycobacterium*.

PARNAS, J., LORKIEWICZ, Z. & MERESTA, L. (1954). Próby z zastosowania odczynu alergicznego przy różycy. [Research on allergy in swine erysipelas.] — *Méd. vét., Varsovie*. 10, 130-132. [In Polish.] 284

A preliminary note discussing the possibility of diagnosing *E. rhusiopathiae* infection by means of a skin test, using an antigen prepared from a broth culture of the organism. In tests on 100 healthy pigs from two farms, all yielded negative skin tests following the i/d injection of 0.2 ml. of the antigen. Of 4 human beings infected with the organism, only 2 gave a positive reaction to this test.—J. R. MITCHELL.

VAN ULSEN, F. W. (1954). Listerellosis bij schapen. [*Erysipelothrix (Listeria) monocytogenes* infection in sheep.] — *Tijdschr. Diergeneesk.* 79, 535-539. [English, French and German summaries.] 285

E. monocytogenes was cultured from the medulla oblongata of a sheep that died from meningo-encephalitis; it had previously been isolated from the spleen of another sheep that had died in the same flock, but the brain had not been examined. In the course of about a year there were seven deaths in a flock of some 80 sheep; all were associated with symptoms of depression, weakness and paresis. The organism could not be cultured from the nasal mucosa of normal sheep.—C. A. VAN DORSSEN.

SEELIGER, H. & LINZENMEIER, G. (1953). Die Listeriose und ihre Erreger. (List. monocytogenes.) [*Erysipelothrix (Listeria) monocytogenes* infection.] — *Z. Hyg. InfektKr.* 136, 335-378. 286

The authors described the cultural and biochemical characteristics of *E. monocytogenes*,

various enrichment methods and the technique of obtaining pure cultures from contaminated material. They also discussed differential diagnosis, epidemiology and incidence of the infection in Germany.

Eighteen of the strains isolated in Germany resembled Type I described by Paterson [*V.B.* 11, 745] very closely. There appeared to be no difference between strains isolated from either man or animals.—E.G.

LINZENMEIER, G. & SEELIGER, H. (1954). Die in vitro-Empfindlichkeit von *Listeria monocytogenes* (Pirie) gegen Sulfonamide und Antibiotica. [Susceptibility in vitro of *Erysipelothrix (Listeria) monocytogenes* to sulphonamides and antibiotics.] — *Zbl. Bakt. I. (Orig.)*. 160, 543-558. 287

The authors studied the susceptibility of 25 strains of *E. monocytogenes* to various sulphonamides and numerous antibiotics and discussed the possibility of their use in the treatment of human infections with this organism. The most effective in vitro are sulphonamides alone and penicillin alone or in conjunction with sulphonamides or streptomycin.—W. G. SILLER.

ÇELIKER, A. (1952). Barbonda kullanılan aktif ve pasif muafiyet usullerinin mukayesesi ve barbonla diğer pastöreller arasında biyolojik münasebetlerin tayini. [Comparison of active and passive immunization methods used in haemorrhagic septicaemia in buffaloes, and determination of its relationship with other pasteurilla infections.] — *Thesis, Ankara*. pp. 46. [Abst. from German summary.] 288

In experiments with rats C. found that fowl cholera antiserum gave passive immunity to infection with the pasteurilla of buffalo haemorrhagic septicaemia, and vice versa. He concluded that the two strains of *Past. septica* producing the diseases are closely related.—A.S.

MICILLO, P. & ORLANDELLA, V. (1954). Ricerche sulla rapida identificazione dei *Proteus*. [Rapid identification of *Proteus*.] — *Nuova Vet.* 30, 114-118. [English, French, German and Spanish summaries.] 289

All of various media containing urea gave constantly good results for the early identification of *Proteus*. There was however some difficulty in interpreting results obtained with the medium described by Elek.—I. MARTINI.

ULBRICH, F. (1954). *Escherichia Coli* Typ O55:B5:H6 als Erreger der Kälberruhr. [*Bacterium coli* type O55:B5:H6 as a cause

of diarrhoea in calves.] — *Zbl. Bakt. I. (Orig.)*. **160**, 506-507. **290**

Type O55:B5:H6 of *Bact. coli* has been recognised as a possible cause of enteritis in babies. U. demonstrated the same type causing calf scour and death in numerous calves of one holding.—W. G. SILLER.

GOTS, J. S., JORDAN, V. E. & BRODIE, A. F. (1952). Studies on the action of nitrofurans on bacterial enzyme systems. III. Furacin interference with dye reductions by *Escherichia coli*.—*Arch. Biochem.* **36**, 285-298. **291**

Nitrofurazone (furacin) inhibited the rate of reduction of the dyes, methylene blue, Nile blue A, and triphenyltetrazolium chloride by *Bact. coli*. The authors discussed this mode of action of the drug on bacteria.—R.M.

OGINSKY, E. L. (1952). Uptake of vitamin B₁₂ by *Escherichia coli*.—*Arch. Biochem.* **36**, 71-79. **292**

Bact. coli rapidly adsorbed vitamin B₁₂ from synthetic media. A mutant strain of the organism adsorbed more of the vitamin than was required for growth or oxidation. In the presence of glucose the rate of adsorption of vitamin B₁₂ decreased.—R.M.

DUBNOFF, J. W. (1952). The role of B₁₂ in methionine synthesis in *E. coli*.—*Arch. Biochem.* **37**, 37-45. **293**

A strain of *Bact. coli* which required vitamin B₁₂ or methionine for growth, grew without either provided that homocysteine was present. The synthesis of methionine from homocysteine by *Bact. coli* was, however, enhanced by the presence of vitamin B₁₂. D. discussed the role of the vitamin in this reaction.—R.M.

MÜLLER, J. (1954). Om forekomst af kroniske bacilbaerere ved paracolibacillrose hos kvaeg. (Foreløbig meddelelse.) [*Bovine Salmonella dublin* carriers.] — *Medlemsbl. danske Dyr-lægeforen.* **37**, 73-75. **294**

An account of *S. dublin* infection in calves in a herd of 150 cattle. Faecal examination revealed 6 carrier cows, all apparently healthy; one recovered, but the others excreted the organism for nearly a year. One carrier cow was slaughtered when no salmonella were demonstrable in the faeces, and *S. dublin* was isolated from the liver, bile, small intestine, spleen, muscle and various lymph nodes. After carrier animals had been eliminated from the farm no further cases of *S. dublin* mortality in calves occurred.—R. B. HOLCOMBE.

BRENNAN, F. M. & LASKEY, H. H. (1954). Chlortetracycline (aureomycin) for salmonella infections in calves.—*J. Amer. vet. med. Ass.* **124**, 384-386. **295**

The authors described an outbreak of salmonellosis in some 50 calves, *S. dublin* predominating. Sulphonamides, penicillin and other antibiotics were used therapeutically, but the best results were obtained with chlortetracycline administered *per os*. Intravenous injection of chlortetracycline in 5 calves produced inappetence and depression and its use by this route was not continued. Introduction into the rumen of ingesta from the rumen of freshly slaughtered cows was valuable during convalescence.

—C. A. E. BRIGGS.

DICKSON, R. S. (1954). Neomycin sulfate in *Salmonella dublin* infection of calves.—*Vet. Med.* **49**, 421-422 & 452. **296**

An outbreak of *S. dublin* infection amongst 50 calves did not respond to treatment with streptomycin or aureomycin by mouth, nor to penicillin injections. Organisms isolated from 10 calves which died were resistant to these antibiotics, but susceptible to neomycin. Neomycin sulphate was given by mouth to the 40 surviving calves, 1g. twice daily. Thirty-three of them recovered after 3-7 days' treatment; 7, which were ill before treatment with neomycin commenced, died.—R.M.

DE BLASI, R. & BIGGI, P. (1954). Rilievi sulla incidenza dei portatori sani di salmonelle fra alcune specie di animali domestici della zona litoranea della Toscana. [*Incidence of salmonella carriers among healthy cattle, horses and pigs in Tuscany, Italy.*] — *Clin. vet., Milano.* **77**, 39-45. [English summary.] **297**

Salmonella strains *S. panama*, *S. aberdeen*, *S. sendai*, *S. napoli* and *S. newington* were discovered in a survey of healthy animal carriers in Tuscany; 0.5% of the cattle, 2% of the horses and 0.8% of the pigs were involved.

—I. W. JENNINGS.

PHILLIPS, J. E. (1953). The isolation of *Salmonella typhi-murium* from skin lesions in a dog.—*J. Path. Bact.* **66**, 572-576. **298**

P. isolated *S. typhi-murium* from ulcers of the skin of a dog on 3 successive occasions at intervals of 3 weeks. The dog was otherwise well, and P. suggested that the organisms were not the primary causes of the ulcers. Agglutination tests with the serum of the dog were positive. The skin disease responded to i/v sulphamethazine therapy.—R.M.

BEDERKE, G. & LUNDT, P. V. (1954). Ergebnisse der Zusammenarbeit von Veterinär- und Humanmedizin bei der Paratyphusbekämpfung im ostfriesischen Inselgebiet. [**Collaboration between veterinary and human medicine in the control of *S. paratyphi B* infection in the East Frisian Islands, Germany.**—*Dtsch. tierärztl. Wschr.* 61, 52-54. 299

Milk-borne paratyphoid in human beings has been recorded in the East Frisian Islands since 1926, and epidemics have occurred from time to time. The authors described an epidemic in 1951-52. Initial examination of the milk and faeces of all the cows in the affected area was negative, but re-examination, made after the cows had been out at pasture, revealed *S. paratyphi B* infection in 6 milch cows from 5 different farms. Repeated faeces and blood examinations of these cows showed that one of them was continuously excreting *S. paratyphi B*, and it was slaughtered. On the affected farms there had been extensive contamination of the pastures with sewage emanating from broken pipes. Control of the infection by heat treatment of milk was not practised in smallholdings, from which summer visitors often received milk.

—W. G. SILLER.

BURR, W. E., JUNGHERR, E., LUGINBUHL, R. E. & JACOBS, R. E. (1954). **Experimental *S. pullorum* contamination of fowl pox vaccine.**—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14-15, 1954. pp. 2. [Mimeographed.] 300

In 1953 several outbreaks of *S. pullorum* infection were attributed to the use of fowl pox vaccine contaminated with that organism. The authors found that *S. pullorum* infection could be established in fowls by the intradermal route using fowl pox vaccine so contaminated with a concentration of 10 organisms per ml.

—D. LUKE.

COSGROVE, A. S. (1954). **Clinical investigation of furazolidone in the treatment of fowl typhoid.**—*Vet. Med.* 49, 393-394. 301

A report on the use of furazolidone [N-(5-nitro-2-furfurylidene)-3-amino-2-oxazolidone] in the treatment of fowl typhoid in 5 flocks of fowls, comprising 17,000 birds, and 2 flocks of turkeys, comprising 1,500 birds. The drug was administered mixed with the food at the rate of 50-100 g. per ton. This treatment greatly reduced the mortality from the disease; but it recurred when treatment stopped.—R.M.

JORDAN, F. T. W. (1954). **The survival of *Salmonella gallinarum* in poultry carcasses.**—*Brit. vet. J.* 110, 387-392. 302

G. studied the survival of *S. gallinarum* in 14 fowl carcasses which were buried, left in water, or left exposed to the atmosphere under British summer and winter conditions. The organism was found in the bone marrow 25 days after exposure to atmospheric conditions in June, and 33 days after burial in June. *Lucilia* larvae from two unopened carcasses, left exposed to the atmosphere in June, were found to be infected after 25 days.—A.S.

DELAY, P. D., JACKSON, T. W., JONES, E. E. & STOVER, D. E. (1954). **A testing service for the control of *Salmonella typhimurium* infection in turkeys.**—*Amer. J. vet. Res.* 15, 122-129. 303

The authors gave a detailed account of the progress made over a 3-year period in a voluntary scheme for the control of *S. typhimurium* infection in turkeys. The control measures were based on the tube agglutination test and the bacteriological examination of reactors, coupled with the elimination of reactors and, where possible, complete replacement of flocks shown to harbour carriers.—E. A. GIBSON.

NORTH, W. R. & BARTRAM, M. T. (1953). **Efficiency of selenite broth of different composition in the isolation of *Salmonella*.**—*Appl. Microbiol.* 1, 130-134. [Abst. from authors' summary.] 304

The authors observed that selenite enrichment broth was markedly deficient for the recovery of salmonella from pure culture and from egg products. Such media were improved by the addition of 10 µg./ml. cystine.—R.M.

SCHOENAERS, F. (1953). Vaccination anti-brucellique chez la vache au moyen du vaccin M (Huddleson). [**Immunization of cows against brucellosis with Huddleson's mucoid vaccine.**]—*Proc. XVth Int. vet. Congr., Stockholm*, 1953. Part I. Vol. 1, pp. 96-100. Discussion: Part II. p. 182. [In French. English and German summaries.] 305

[See V.B. 24, 1020 for the original paper.] In discussion on this paper questions about the location of *Br. abortus* in the body of vaccinated cattle, and the strength of a challenge dose employed to test immunity, were raised. T. S. Gregory suggested that challenge by exposure to natural infection should give more constant results than the conjunctival instillation of cultures.—R.M.

MCDIARMID, A. (1954). A comparison of the intradermal and subcutaneous routes in producing immunity to brucellosis in cattle.—*J. comp. Path.* **64**, 384-391. [Author's summary modified.] 306

A small dose (0.2 ml.) of Strain 19 *Br. abortus* vaccine administered subcutaneously was shown to confer an immunity to heifers in no way inferior to that produced by the same dose intradermally or by a larger dose (5.0 ml.) by the subcutaneous route. The protective power of the vaccine did not appear to be as effective as in previous experiments [V.B. **20**, 52 & **21**, 602], possibly because the heifers were 2 months pregnant when vaccinated and the challenge dose was given 3 months after vaccination.

JACOTOT, H. & VALLÉE, A. (1954). Essais comparatifs d'immunisation du rat blanc contre la brucellose expérimentale au moyen de vaccin vivant et de vaccin tué. [Immunization of white rats against brucellosis using living and dead vaccines.]—*Ann. Inst. Pasteur* **87**, 152-158. 307

A phenol-killed Strain 19 *Brucella* vaccine conferred immunity on rats for a year against lethal inoculations of virulent *Brucella* organisms. The vaccine was as effective as a living vaccine of the same strain. The experiments were performed on about 70 rats: the authors commented that their results were contrary to general experience.—A.S.

FEJÉR, I. (1954). A foglalkozási brucellosis. [Occupational brucellosis.]—*Mag. állator.* *Lajka* **9**, 88-89. 308

The latest mass blood testing figures obtained for bovine brucellosis in Hungary revealed an incidence of 15-20% reactors. Latent brucella infections have been known to occur among the rural population since 1935, the incidence being particularly high in veterinary surgeons: 14-16% of serum samples from the veterinary personnel in Békés province gave a positive reaction. *Br. abortus* is usually the species concerned; *Br. suis* occurs in a small number of cases.—I. MARTINI.

BRAUN, W. & OGLESBY, G. (1954). On the problem of naturally occurring aberrant strains of *Brucella*.—*Proc. Soc. exp. Biol., N.Y.* **86**, 757-760. [Authors' summary modified.] 309
"Typical" strains of *Br. abortus* and of *Br. suis* were found to mutate spontaneously to dye-resistance (thionine and fuchsine, respectively) at an average rate of 6×10^{-10} . Most of the

resistant mutants, and also mutants displaying altered CO₂-requirements, competed successfully with their typical parent type when inoculated into g. pigs. The authors discussed the significance of naturally occurring aberrant strains of *Brucella*, and taxonomic problems, in the light of these findings.

GREIB, E. & DUQUÉNOIS, P. (1953). Note préliminaire sur l'action antibiotique de la piloselle dans la fièvre ondulante. [Antibiotic action of hawkweed (*Hieracium pilosella*) on *Brucella melitensis* and *Br. abortus*.]—*Bull. Acad. nat. Méd.* **137**, 319-322. 310

Extracts of the whole plant of *H. pilosella* suppressed the growth of *Br. abortus* and *Br. melitensis*. The authors claimed to have successfully treated undulant fever in 5 human beings by administering a decoction of the plant. —R.M.

ZERFASS, H., FRITZSCHE, K., TAYLER, E. & SCHOREGGE, B. (1954). Die Schaffbrucellose in Rheinland-Pfalz. [Brucella infection in sheep in the Rhineland-Palatinate.]—*Tierärztl. Umsch.* **9**, 35-38. 311

The authors described an outbreak of *Br. melitensis* infection in sheep and in human beings in contact with them. The original infection in sheep was traced to contact with a flock from the South of France.—W. G. SILLER.

VAN DRIMMELLEN, G. C. (1953). Clinical diagnosis of brucellosis and some other genital infections in cattle.—*J. S. Afr. vet. med. Ass.* **24**, 197-203. 312

The author discussed the differentiation of genital infection in cattle with *Brucella*, *Vibrio fetus*, *Trichomonas foetus* and TB. He described techniques which may be employed in the field to supplement clinical examination in the diagnosis of outbreaks of abortion. These included the examination of stained smears of vaginal mucus. He also described the types of samples required for laboratory tests.

—A. ACKROYD.

BELLINGER, H. (1954). Statistische Untersuchungen über die Beziehungen zwischen der Streptokokken-Mastitis und der Bangschen Krankheit beim Rind. [Statistical investigation into relationships between streptococcal mastitis and contagious abortion in cattle.]—*Zbl. Bakt. I. (Orig.)* **160**, 559-565. 313

Statistical study of the results of milk ex-

amination and of published data proved that *Brucella abortus* infection and streptococcal mastitis did not influence one another and that the one did not lower the animal's resistance to the other.—W. G. SILLER.

STELLMACHER, W. (1954). Die unspezifischen Deckinfektionen des Rindes unter besonderer Berücksichtigung der Ätiologie. Übersichtsreferat. [Non-specific venereal infections in cattle. A review.]—*Mh. VetMed.* 9, 62-66; 87-89. 314

S. gave a general comment on present knowledge concerning a number of non-specific venereal infections in cattle. He covered *Pseudomonas pyocyanea*, haemolytic streptococci, *Staphylococcus pyogenes*, *Corynebacterium pyogenes*, *Bacterium coli* and *Proteus* infection. He also included *Vibrio fetus*. Secondary contaminants, and techniques of sampling and diagnosis were also discussed.

—A.S.

RAO, S. B. V., THAKRAL, B. M. & DHANDA, M. R. (1954). Studies on fowl spirochaetosis with special reference to penicillin therapy and the development of an egg-adapted vaccine for its control.—*Indian vet. J.* 31, 1-14. 315

Penicillin injected i/m at the height of infection at a dosage of 4,000 units per lb. body wt., was curative in cockerels infected artificially with *Borrelia anserina* when 4-5 months old. The minimum infective dose of virulent blood in fowls was 1 ml. of a 10^{-3} dilution obtained from a fowl at the height of the reaction after artificial infection and estimated to contain 46,600 spirochaetes.

A chick embryo vaccine from a strain of *B. anserina* maintained at Mukteswar for over 20 years promises a durable immunity. Chickens inoculated i/m with 0.1 ml. when 10-12 weeks old withstood a challenge dose of a thousand M.I.D. a month later, and other chickens proved refractory at the 12th month.—F.E.W.

WARD, M. K. (1954). Some problems in the laboratory diagnosis and control of leptospirosis.—*Vet. Med.* 49, 147-152 & 170. 316

W. gave a list of species of leptospira known to be present in domesticated animals in North America, and discussed laboratory requirements for the accurate diagnosis of *Leptospira* infection.—R.M.

GÜRTÜRK, S. (1952). Die bazilläre Ikterohämoglobinurie des Rindes in der Türkei.

[Haemoglobinuria due to *Clostridium haemolyticum* in cattle in Turkey.] — *Z. Immun-Forsch.* 109, 462-465. 317

G. isolated *Clostridium haemolyticum* from the liver of a cow with haemoglobinuria. He stated that it was the first time the organism had been isolated from bovine haemoglobinuria in Turkey.—R.M.

HEINIG, A. (1954). Experimentelle Untersuchungen über den Eintritt der Immunität nach einmaliger Tetanus-Schutzimpfung. [Experimental research on immunity against tetanus after single immunization.] — *Arch. exp. VetMed.* 8, 394-403. 318

An account of immunization of horses, sheep and g. pigs against tetanus.

BÖNICKE, R. & KRACHT, J. (1954). Untersuchungen über die bakteriostatische Wirkung von Säurehydraziden gegen anaerobe Sporenbildner. [Bacteriostatic action of acid hydrazides on spore-forming anaerobes.] — *Z. Hyg. InfektKr.* 139, 140-154. 319

Iso-nicotinic acid hydrazide and 9 other acid hydrazides were inactive against *Cl. welchii*, *Cl. botulinum*, *Cl. tetani*, *Cl. oedematiens* and *Cl. septicum* in vitro.—R.M.

FUNDER, S. (1953). Practical mycology. Manual for identification of fungi. pp. 145. Oslo: Brøgers Boktr. Forlag. 39s. [In English.] 320

This work 'designed to serve as an introduction to mycology for beginners and as an aid for those who without any special botanical knowledge are interested in identifying the most common fungi they meet with in the course of their work' . . . is, like most such short cuts, an unsatisfactory work to any teacher of mycology and its use to the uninitiated is difficult to assess.

The book opens with a brief but clear account of the commoner mycological terms and this is followed by short sections on the classification of fungi and on laboratory methods. Most of the Manual (pp. 41-123), however, is devoted to a series of rather mechanical diagrammatic line drawings to illustrate the various features of a number of important genera and a few species of fungi. The grouping of these in three series, as fungi of particular interest in general mycology, in medical mycology and in plant pathology has resulted in the appearance of a number of the illustrations in two, and several in all three sections, a duplication that

seems hardly justified. Many of the figures are clear and helpful, but others are less satisfactory and the absence of any identification of the scale is likely at times to mislead. In conclusion there is a short list of references, a glossary and an index while M. A. Gordon's Key to the Human Mycoses from the 1952 *Journal of Bacteriology*, is reprinted after the section on fungi of medical interest.—G. C. AINSWORTH.

KRETZSCHMAR, C. (1954). Ein Beitrag zu den Mykosen bei Tieren. [*Animal mycoses.*]—*Mh. VetMed.* 9, 274-278. 321

A detailed, illustrated pathological and histological account of a generalized mycotic infection in pigs. K. attributed the condition to a species of *Mucor* but as the pathogen was not cultured its identity must remain in doubt.

—G. C. AINSWORTH.

DROUHET, E. & COUTEAU, M. (1954). Sur la détermination des *Candida*. Étude des caractères morphologiques et physiologiques de 78 souches isolées de prélèvements pathologiques. [*Identification of Candida species.*]—*Ann. Inst. Pasteur.* 86, 602-617. 322

This useful paper gives working details of techniques employed for the identification of species of *Candida* and summarizes the characteristics of eight species. Among the recommended techniques is a new one devised for the production of chlamydo-spores by *C. albicans* by culturing the fungus at 37°C. in 10-20% CO₂.

—G. C. AINSWORTH.

SIEBURTH, J. McN. & ROTH, F. J., JR. (1954). The effect of aureomycin and terramycin on *Candida albicans* in the fecal microflora of chicks and turkey poults.—*J. Bact.* 67, 460-464. 323

While yeasts or yeast-like organisms were not detected in the faeces of week-old turkey poults or day-old chicks when fed a normal diet, the yeast, *Torulopsis (Cryptococcus) molishianus* was detected in the faeces 5 days after supplementing the diet with aureomycin (but not terramycin). In other studies *Candida albicans* infection was established more easily in birds fed a diet supplemented with either aureomycin or terramycin than in birds on a normal diet, and while bacterial antagonists to *C. albicans* were detected in the faeces of birds on the antibiotic supplemented diet such organisms were absent from birds on the basic diet. Further, the addition of therapeutic levels of aureomycin or terramycin to the basic diet of birds inoculated with *C. albicans* appeared to prevent the develop-

ment of physical symptoms and deaths attributable to moniliasis. The authors discussed the possible implications of these findings.

—G. C. AINSWORTH.

ROWLEY, D. A., HABERMAN, R. T. & EMMONS, C. W. (1954). Histoplasmosis: pathologic studies of fifty cats and fifty dogs from Loudoun County, Virginia.—*J. infect. Dis.* 95, 98-108. [Authors' summary modified.] 324

H. capsulatum was isolated from 22 of 50 cats, 43 of which were apparently healthy and from 22 of 50 dogs, 49 of which were apparently healthy, from Loudoun County, Virginia. In both species it was isolated most frequently from the cervical and peribronchial lymph nodes. Multiple positive cultures were obtained from numerous tissues of 8 of the cats and 9 of the dogs, none of which were considered to be clinically ill with the disease. Only one of the cats gave a positive reaction to the skin test. None of the serum samples from the cats had agglutinins for collodium particles sensitized with histoplasmin, nor complement-fixing antibodies for the whole yeast phase antigen of *H. capsulatum*. No characteristic gross or histopathological lesion was associated with the isolation of the organism from the cats; it was not found in histological sections from any of them.

Fourteen dogs gave positive reactions to the skin test, 27 had agglutinin titres of 1:20 or higher for collodium particles sensitized with histoplasmin, and 15 had complement-fixation titres of 1:15 or higher for the whole yeast phase antigen. Neither the skin test nor either of the serological tests gave a good index of whether or not the organism could be isolated from the dog. A variety of intrapulmonary and peribronchial lymph node lesions were found, but it was not established whether any of them were caused by *H. capsulatum*. The organism was found in histological sections from 8 of the 50 dogs; in 7 of these 8, it was demonstrable only by the use of a stain for polysaccharide. The authors discussed the limitations of the methods used for skin tests, serological tests, and for obtaining cultures of fungi from animal tissues.

PEREZ CORNEJO, S. & SAN MIGUEL, J. (1954). Contribución al estudio micológico de la tiña del caballo. [*Trichophyton infection in horses.*]—*Zoosatria, Chile.* 3, No. 11, pp. 7-17. 325

The authors gave a brief historical introduction and general account of ringworm in horses and reported the results of a study of 39 cases in central Chile. All of the 21 culturally

positive cases yielded strains of *T. mentagrophytes*; their macroscopic and microscopic characters were given in tabular form.

—G. C. AINSWORTH.

AGRIMI, P. (1954). Sulla aspergillosi del fagiano. [*Aspergillus* infection in pheasants.] —*Zooprofilassi*, 9, 87-91. 326

A note recording *A. fumigatus* infection in 2 pheasants, both of which had typical lesions of the lungs and air-sacs. In addition there was involvement of the digestive tract of one bird and the kidneys of the other.—I. W. JENNINGS.

PEZZOLI, G. (1953-54). Di un caso di actinomicosi mammaria nel cane. [*Actinomycosis* of the mammary gland in a bitch.]—*Nuova Vet.* 29, 349-354; 30, 21-24. 327

An account of a case of actinomycosis in a bitch involving mammary glands and the overlying skin. Surgical treatment, accompanied by nicotinic acid hydrazide therapy, and then by iodine therapy, failed to clear up the infection, but after a course of streptomycin the condition was cured.—I. W. JENNINGS.

ANSBACHER, S. (1954). Treatment of actinomycosis with isoniazid.—*Vet. Med.* 48, 357-358. 328

A note recording the successful treatment of actinomycosis [*Actinomyces bovis* infection] in a Holstein-Friesian heifer by the administration of a daily dose of 20 mg./kg. of iso-nicotinic acid hydrazide ('nydrazid') for 100 days.

—G. C. AINSWORTH.

CHU, H. P. (1954). The identification of infectious coryza associated with Nelson's cocco-bacilliform bodies in fowls in England and its similarity to the chronic respiratory disease of chickens. — *Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 246-251. [English and French summaries: pp. 49-50 of Summaries of Section Papers.] [Author's summary modified.] 329

C. described a chronic respiratory infection of fowls in many parts of England, resembling infectious coryza due to cocco-bacilliform bodies, described by Nelson [*V.B.* 5, pp. 471 & 602, 7, pp. 519-520]. The infection was characterised by a long incubation period of 1-4 weeks and a prolonged course of several months. Growth was stunted, but mortality was low. The disease usually started with rhinitis and sinusitis. Smears of the sinus exudate taken before complication by secondary bacterial infection showed large numbers of cocco-bacilliform bodies. These organisms could be cultivated in

Tyrode solution containing chick embryonic tissue.

The intranasal inoculation of sinus exudate or tissue culture containing the cocco-bacilliform bodies reproduced the disease. Both the natural and experimental disease resembled that seen by Nelson except that involvement of the trachea and the air sac was noted in some of the outbreaks. It was therefore similar also to the chronic respiratory disease of chickens described by Delaplane & Stuart [*V.B.* 15, 1197]. C. suggested that the infectious coryza studied by Nelson and the chronic respiratory disease now prevalent in the U.S.A. are probably the same disease and are both very similar to, if not identical with, the disease which he was investigating.

In view of the close similarity between the cocco-bacilliform bodies and pleuropneumonia-like organisms (PPLO) C. attempted to isolate PPLO from the infectious material known to contain the cocco-bacilliform bodies. PPLO were isolated from most of them, but it was difficult to reproduce the disease intranasally with the cultures of PPLO so far obtained. Later PPLO were isolated from cases of infectious bronchitis, infectious laryngotracheitis and fowl pox and appeared to be responsible for certain chronic pathological conditions occurring in these diseases. He also succeeded in isolating PPLO from apparently healthy fowls and turkeys, and was comparing a number of strains and trying to assess their pathogenicity. It is probable that there are different types of PPLO, some being sufficiently pathogenic to cause disease by themselves, others only capable of acting as secondary invaders. The cocco-bacilliform bodies probably represent a type which is more pathogenic as well as more exacting in its nutritional requirement.

STUBBS, E. L., SPERLING, F. G. & LECCE, J. G. (1954). Chronic respiratory disease.—*Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 244-246. [English and French summaries: pp. 48-49 of Summaries of Section Papers.] 330

A general account of chronic respiratory disease in fowls.—R.M.

LUGINBUHL, R. E., JUNGHER, E. L., JACOBS, R. E. & WINN, J. D. (1954). Laboratory analysis of one month's respiratory consignments.—*Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14-15, 1954. pp. 4. [Mimeographed.] 331

Detailed laboratory examinations of material from 38 outbreaks of respiratory disease in

fowls, including inoculation into chick embryos and the infraorbital sinus of young turkeys resulted in the isolation of various bacteria and moulds from a fairly high proportion of cases, suggesting that these agents may be complicating factors in chronic respiratory disease of fowls. Turkey inoculation followed by histological examination is a useful method for the diagnosis of chronic respiratory disease, whereas chick embryo inoculation proved disappointing.—D. LUKE.

JUNGHERR, E., LUGINBUHL, R. E. & AVAMPATO, J. E. (1954). Pathogenicity tests with seven pleuropneumonia-like organisms from different avian sources. — *Proc. 26th Ann. Meet. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr.*, Raleigh, N.C., June 14-15, 1954. pp. 4. [Mimeographed.] 332

The authors found that all of seven strains of pleuropneumonia-like organisms had remained pathogenic for fowls despite prolonged propagation in eggs and culture media. They considered the most sensitive method of demonstrating pathogenicity for fowls to be the histological demonstration of lymphoid infiltrations in the eye, 7 or 14 days after intra-ocular inoculation. Intra-tracheal inoculation usually gave rise to air sac lesions, similar to those seen in naturally occurring cases of air sac disease.

—E. A. GIBSON.

I. KELLER, R. & MORTON, H. E. (1954). The growth of pleuropneumonia-like organisms of human origin; cultivation in the developing chick embryo and an *in vitro* growth cycle.—*J. Bact.* 67, 129-134. 333

II. LECCE, J. G., STINEBRING, W. R. & MORTON, H. E. (1953). Chick embryo extract, an enrichment for certain strains of pleuropneumonia-like organisms isolated from man.—*Ibid.* 622-623. 334

III. MORTON, H. E. & LECCE, J. G. (1953). Selective action of thallium acetate and crystal violet for pleuropneumonia-like organisms of human origin.—*Ibid.* 646-649. 335

I. Five out of six strains of pleuropneumonia-like organisms isolated from the human urogenital tract grew as well in the allantoic fluid of fowl embryos as in artificial media. The sixth strain grew only in the latter.

II. An extract of 9-day-old fowl embryos, when added to the medium described by Morton, Smith & Lebermann (1951), enhanced the growth of pleuropneumonia-like organisms isolated from the human urethra. The supernatant fluid of extract which had been heated for

20 min. at 100°C. also enhanced growth of the organism.

III. Pleuropneumonia-like organisms isolated from the human urogenital tract grew well in the presence of thallium acetate at a conc. of up to 1:500, and other organisms were inhibited. The action of crystal violet was similar, providing that the medium contained about 3 mg. protein per ml.; 25% ascitic fluid contains about this amount of protein.—R.M.

LEPOVETSKY, B. C., WEISER, H. H. & DEATHERAGE, F. E. (1953). A microbiological study of lymph nodes, bone marrow and muscle tissue obtained from slaughter cattle.—*Appl. Microbiol.* 1, 57-59. [Authors' summary modified.] 336

While the majority of the popliteal and pre-scapular lymph nodes examined during this study contained Gram-negative rods and cocci, diphtheroids and several types of anaerobes, only a few of the samples of bone marrow and muscle tissue appeared to harbour bacteria. The proteolytic nature of many of the organisms isolated, together with their ability to grow anaerobically and at a wide range of temperature, indicate that they might be capable of producing deep spoilage in carcasses that are inadequately refrigerated. Furthermore, the presence of large numbers of organisms in the lymph nodes suggests that these tissues may be the point from which deep spoilage in beef arises.

(1953). Adaptation in micro-organisms. Third Symposium of the Society for General Microbiology, held at the Royal Institution, London, April, 1953. [Edited by: GALE, E. F. & DAVIES, R.] pp. viii+339. Cambridge: University Press. 30s. 337

A symposium of fifteen papers covering various aspects of the adaptation of micro-organisms to their environments.

The papers were:— Adaptation, evolutionary or physiological: or Darwinism among the micro-organisms, (R. Y. Stanier); Observations on bacterial adaptation, (A. C. R. Dean and Sir Cyril Hinshelwood); The nature of variations affecting bacterial adaptability, (A. W. Ravin); A specific relation between enzyme adaptation and cytoplasmic mutation, (P. P. Slonimski); The nature of the precursor in the induced synthesis of enzymes, (S. Spegelman and H. O. Halvorson); Specific inhibition and induction of enzyme biosynthesis, (M. Cohn and J. Monod); Stages in enzyme adaptation, (M. R. Pollock); The effect of temperature on enzymic adaptation, growth and drug resistance, (R. Knox);

The development of drug resistance in micro-organisms, (E. P. Abraham); Antibiotic-resistant staphylococcal variants, (Mary Barber); The ecology of tubercle bacilli resistant to streptomycin and isoniazid, (D. A. Mitchison); Influence of bacteriophage on bacterial variation and

evolution, (L. F. Hewitt); Adaptations in *Paramecium*, (G. H. Beale); Environmental and other aspects of adaptation in thermophiles, (L. F. L. Clegg and S. E. Jacobs); Ecological adaptation in fungi, (W. B. Brown and R. K. S. Wood).—A.S.

See also *absts.* 450 (inhibition of sarcoma in mice by *Aspergillus fumigatus* culture filtrates); 533 (prevention of puerperal bacterial infections by sulphonamides and antibiotics); 545 (wet-film Indian ink method for examining micro-organisms); 550 (report, Nyasaland Protectorate); 551 (report, Belgium); 552 (book, B.C.G.); 553 (book, bacterial physiology); 554 (book, mycology).

DISEASES CAUSED BY PROTOZOAN PARASITES

BOERO, J. J. (1954). Notas sobre tripanosomiasis equina. [*Equine trypanosomiasis.*]—*Gac. vet., B. Aires.* 16, 52-56. 338

B. discussed the action of antrycide on *Trypanosoma evansi* *in vivo* and *in vitro*. He considered that relapses following antrycide treatment were caused by the survival of trypanosomes in the c.s.f., where the drug did not reach them in effective quantities. He recommended research into a "biohistamine" which would facilitate the penetration of antrycide into the c.s.f.—A.S.

TRUMIĆ, P. & TURUBATOVIĆ, R. (1954). [*Antrycide in prevention and treatment of dourine.*]—*Acta vet., Belgrade.* 4, 10-14. [In Serbian. Abst. from French summary.] 339

The authors controlled experimental dourine in rats and g. pigs by a single s/c inj. of antrycide.—A.S.

I. UNSWORTH, K. (1954). The curative effect of ethidium bromide against *Trypanosoma vivax* infections of zebu cattle in West Africa, with observations on the toxicity of the drug.—*Ann. trop. Med. Parasit.* 48, 229-236. 340

II. UNSWORTH, K. (1954). Further observations on the curative effect of ethidium bromide against *Trypanosoma vivax* infections of zebu cattle in West Africa.—*Ibid.* 237-241. [Author's summaries modified.] 341

I. U. described experiments to determine the curative value of ethidium against a syringe-passaged strain of *T. vivax* in West African zebu cattle. Observations were also made on the toxicity of the drug for the same cattle. The drug cured infections with the particular strain of *T. vivax* used in doses of 1 mg. per kg. In further experiments with small groups of cattle, smaller doses (minimum 0.1 mg. per kg.) were used, without the occurrence of relapse within 16 weeks after treatment.

Of eight cattle inoculated with the same strain of *T. vivax* but left untreated, four died from trypanosomiasis, one died as a result of a liver biopsy accident, and three survived for 16 weeks, although infected and in poor condition.

Haemoglobin estimations made regularly on all the treated cattle showed that the administration of ethidium bromide was followed by a rapid return of Hb values to normal.

Observations on the toxic effect of the drug showed that the local reactions produced after subcutaneous inoculation of doses of 2.5 mg. per kg. and over are of such severity as to preclude the use of such doses in the field. Administration of ethidium bromide to both trypanosome-infected and uninfected cattle was followed in a proportion of animals by a rise in temperature. The fact that the tendency of the drug to produce this reaction does not appear to increase with dosage suggests that the drug itself is only partly responsible for the reactions observed.

No appreciable change occurred in the liver within 48 hours of dosage with 1 mg. per kg. of ethidium bromide. The administration of 4 mg. per kg. of the drug caused the appearance of abnormal quantities of fat in the liver within 48 hours. As distinct from these observations on immediate toxicity, examination of liver biopsy specimens from cattle taken at intervals of 2, 6 and 12 weeks after treatment with from 1 to 10 mg. per kg. of ethidium bromide failed to reveal liver damage attributable to the drug. Van den Bergh tests, carried out at fortnightly intervals throughout the post-treatment period, gave negative results. [See also *V.B.* 24, 71 & 1053].

II. Taking as a criterion of cure the absence of parasites from the peripheral blood for 6 months after treatment, U. demonstrated that ethidium bromide cured infections with the particular strain of *T. vivax* used in single doses of 1 mg. per kg. and of 2 mg. per kg., but failed to give complete cure in doses of 0.25 and 0.5 mg. per kg. Of 9 cattle treated with the latter dosage, 3 relapsed, and of 8 cattle sufficiently observed after treatment with 0.5 mg. per kg. one relapsed. Relapses occurred 55, 99, 101 and 108 days after treatment.

Although treated cattle were trekked a distance of 100 miles in 5 days during the course of the experiment, no new infections were detected

when daily examinations were resumed at the end of the journey. Of 4 cattle infected with the same strain of *T. vivax* but left untreated, all died from trypanosomiasis within 93 days.

FIENNES, R. N. T.-W.- (1954). **Haematological studies in trypanosomiasis of cattle.**—*Vet. Rec.* 66, 423-434. [Author's summary slightly modified.] 342

The blood of normal cattle, under conditions represented at Kabete, is subject to physiological changes of a large order, reflected chiefly in changes of red cell counts, cell size and cellular haemoglobin, and dilution of the plasma. These changes may occur during the course of a single day, when the chief features are alterations of circulating blood volume and haemo-dilution. There are, also, periodical variations, which are a part of an erythropoietic cycle.

It was found that a reduced red cell count might be due to haemo-dilution and, in this case, would often represent an increase in the actual numbers of circulating red cells. In cattle infected with *T. congolense*, it was found that the first sequence of the so-called anaemia was, in fact, hydraemia, *i.e.*, although red cell counts became reduced, the numbers of red cells in circulation were increased, but were more diluted. Subsequently, a true reduction in the number of circulating red cells was found, accompanied by loss of plasma solids. There are two sharply contrasted stages of the disease, the acute and the chronic, which are separated by a crisis. Different factors are responsible for the symptoms and pathology of the disease during the two stages.

During the acute stage severe anaemia develops primarily as a result of removal and destruction of red cells by the spleen and other organs. It is intensified at times of crisis by haemolysis, produced by haemolysin emanating from the bodies of trypanosomes injured by trypanolysin. Haemolysis and trypanolysis occur at the same time and cause the phenomena of crisis and collapse. The anaemia of the acute stage is macrocytic. The anaemia of the chronic stage is microcytic, of less severity, and may be accompanied by high red cell counts. Haematocrit and haemoglobin remain low. It is not the primary cause of the progressive disease.

During the chronic stage, the wasting condition, terminating in death from extreme inanition is due: (a) to dilution of the blood plasma and reduction of its volume and solids content, whereby the total of nutrients offered to the tissues is diminished; (b) to circulatory changes,

whereby the passage of oxygen and nutrients from the blood to the tissues is impaired. The result is a form of physiological starvation, from which death ensues, even if abundant food is available to the animal. In rare cases natural recovery occurs. In such cases alterations of the plasma composition are rare or do not occur. This shows that the anaemia, *per se*, is not of great significance during the chronic stages.

ROBSON, J. & MILNE, A. H. (1954). **The effect of ethidium bromide on early trypanosomiasis caused by *T. congolense* in zebu cattle using a standard dose irrespective of live weight.**—*Vet. Rec.* 66, 415-416. [Authors' summary modified.] 343

Ethidium bromide was tested against trypanosomiasis caused by *T. congolense* at two dosage rates irrespective of live weight, treatment being given 6 days after all infected cattle showed positive thick blood slides. None had relapsed by the 125th day after treatment. Untreated controls proved the strain of *T. congolense* to be fully virulent. Seven out of 60 treated cattle were still free from trypanosomes in the peripheral circulation 90 days after treatment, having been treated 53 days after infection.

The authors concluded that 0.25 g. ethidium bromide used in the early stages of the disease caused by *T. congolense* was a suitable and safe standard curative dose for Tanganyika zebu cattle.

UNSWORTH, K. (1954). **Observations on antrycide-fast strains of *Trypanosoma congolense* and *T. vivax*.**—*Ann. trop. Med. Parasit.* 48, 178-182. 344

By giving sub-curative doses of antrycide to rats infected with *T. congolense*, and then inoculating their blood, containing trypanosomes, into other rats which in their turn received a higher dose, the author raised the antrycide resistance to 16 times its original level. In subsequent serial passage in untreated rats the strain lost nearly all its resistance in 27 weeks (35 passages). In another experiment cattle were exposed to risk of infection with *T. vivax*: at the 1st and 2nd appearances of trypanosomes in the blood antrycide at 5 mg./kg. was given, then, at the 3rd appearance 7.5 mg./kg., and later again 10 mg./kg. At this stage the strain was inoculated into sheep where it resisted a dose of 5 mg./kg. but was controlled by a dose of 7.5 mg./kg.

The author recommended that the injection of antrycide into cattle in tsetse areas should not

be delayed until trypanosomes appear in the blood, but should be carried out regularly at suitable intervals.—A.S.

MEYER, H. & PORTER, K. R. (1954). A study of *Trypanosoma cruzi* with the electron microscope.—*Parasitology*. **44**, 16-23. **345**

The authors examined by electron microscopy crithidia of *T. cruzi* from blood agar cultures, and adult tissue forms from tissue cultures. The internal body structures were too dense for study by this method, but in places fine striations, in spiral or parallel arrangement could be seen in the cytoplasm. They were probably of a protein nature, being digested by trypsin. There were also dense spherical lipid structures in the body. The whole body was enveloped in a fine transparent sheath. The flagellum was formed by an axoneme consisting of five or nine fibres.—A.S.

WESTPHAL, A. (1954). Zur Systematik von *Toxoplasma gondii*. Die Toxoplasmen als Trypanosomidae. [Classification of *T. gondii*. Toxoplasms as trypanosomes.]—*Z. Tropenmed. u. Parasit.* **5**, 145-182. [English summary.] **346**

W. presented evidence in support of the classification of *T. gondii* among the Trypanosomidae. He suggested that it corresponds to *Leishmania* in which the blepharoplast and the ability to develop in an arthropod have been lost.—L. P. JOYNER.

GALASSI, D. (1954). Patogenicità per il *Mesocricetus auratus* e resistenza alle basse temperature di un ceppo di *Leishmania* isolato dal cane. [Pathogenicity for hamsters and resistance to low temperature of a strain of *Leishmania* isolated from a dog.]—*Riv. Med. vet., Parma*. **6**, 69-74. [English, French and German summaries.] **347**

A strain of *Leishmania* obtained from a skin lesion in a dog killed hamsters in 17 days. Two out of 4 hamsters died from *Leishmania* infection following inoculation with organ suspensions of infected hamsters kept at -30°C . for 66 days.—R.M.

BELLI, M. (1951). Tûrkiyede sığırlarda *Trichomonas foetus* üzerinde araştırmalar. [Bovine trichomoniasis not present in Turkey.]—*Thesis, Ankara*. pp. 51. [Abst. from French summary.] **348**

B. investigated abortion in cattle over a period of 3 years without once encountering *Trichomonas foetus*. Since the abattoir in which

he worked dealt with cattle from all parts of Turkey he concluded that the organism is not present in that country.—A.S.

KERR, W. R. & ROBERTSON, M. (1954). Passively and actively acquired antibodies for *Trichomonas foetus* in very young calves.—*J. Hyg., Camb.* **52**, 253-263. **349**

Normal adult cattle have an agglutinin specific for *Tr. foetus*, which the authors considered to be a native constituent of the serum, and not to arise in response to an exogenous antigen. The calf at birth does not possess this agglutinin, but receives it in the colostrum in the first 24 hours of life. The authors investigated the disappearance of this passively acquired agglutinin and its replacement by auto-genous agglutinin.

The i/m injection of *Tr. foetus* antigen into very young calves induced no antibody formation, although when the dose was fairly small the animal could produce antibody in response to the same antigen given at a later time. When however, a large dose of antigen was given to a young calf, the subsequent ability of the animal to react to the same antigen was seriously impaired though its reaction to other antigens remained unaffected.—A.S.

VACCARI, I. & BALLARINI, G. (1954). Studi sulla biologia del *Trichomonas vitulae* Mazzanti 1900-XXVII. "L'intossicazione pura" causa di morte dell'unità culturale. Indagini sperimentale sulle condizioni limitanti le colture in L.E.S.m. [Biology of *Tr. foetus*. "Pure intoxication", the cause of death of *Tr. foetus* in cultures.]—*Riv. Med. vet., Parma*. **6**, 1-24. **350**

The death of cultures of *Tr. foetus* after growth for about 200 hours in modified L.E.S. medium (Locke's solution, egg yolk, serum), was probably due to the accumulation of toxic substances resulting from metabolism. It was not due to overcrowding of the organisms or to exhaustion of the culture medium. Serum was the only indispensable constituent of the culture medium.—R.M.

FABIANI, G. & FULCHIRON, G. (1954). Influence de la splénectomie sur le maintien de l'immunité spécifique au cours du paludisme expérimental du rat blanc. [Influence of splenectomy on immunity in experimental malaria in white rats.]—*C. R. Soc. Biol., Paris*. **148**, 673-675. **351**

When splenectomy was carried out in 60 adult white rats which had spontaneously recovered from experimental malaria, 50 relapsed.

Of the 46 which were splenectomized less than a month after recovery all relapsed and 26 died, while of the 14 which were splenectomized more than a month after recovery only 4 relapsed, and of these 2 had in addition undergone bleeding by cardiac puncture, and a third adrenalectomy. The authors concluded that the spleen, although it plays an important role in defence against malaria, is not essential to defence once the rat has developed immunity.—A.S.

DE BRITO GUTTERRES. (1954). Piroplasmoses. Études sur "*Babesiella berbera*" (Sergeant, Donatien, Parrot, Lestoquard, Plantureux et Rougebief, 1924). Quelques observations hémo-sérologiques. [**Bovine piroplasmosis (*B. berbera*) in Portugal.**] — *Bull. Off. int. Epiz.* 41, 143-196. 352

A historical note on *Babesia berbera* infection in Portugal and Mozambique, followed by some case histories and an extensive discussion of diagnostic procedures.—A.S.

SIMIĆ, Č. & PETROVIĆ, Z. (1954). [**Ovine piroplasmosis in Yugoslavia.**]—*Acta vet., Belgrade*, 4, 3-9. [In Serbian. Abst. from French summary.] 353

See also absts. 550 (report, Nyasaland Protectorate); 551 (report, Belgium).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

PYL, G. (1953). Die Insel Riems. [**History of the Foot and Mouth Disease Research Institute on the island of Riems.**] — *Arch. exp. VetMed.* 6, 72-100. 355

The German government appointed in 1897 a special committee headed by Friedrich Loeffler, to investigate the cause of F. & M. disease and possible control measures. Loeffler, who was soon afterwards appointed professor of bacteriology and hygiene at Greifswald University, established that the disease was caused by a filtrable agent. He did not succeed, however, in developing an immunization method of practical value. His experimental farm on the outskirts of Greifswald was closed in 1906, because several outbreaks in the district had been traced to that source.

After a long search for a suitably isolated location Riems, a small island of about 60 acres, half a mile off the coast, six miles east of Greifswald, was acquired. Conditions there were at first rather primitive and during the first world war work came practically to a standstill. Otto Waldmann took over in 1919, his task being to develop Loeffler's hyperimmune serum. He succeeded in infecting g. pigs a year later,

The authors investigated the distribution of ovine piroplasmosis in 5 districts of eastern Yugoslavia. Epidemics usually began in the last two weeks of May and came to an end in late July. Infection was transmitted by *Rhipicephalus bursa*. Mortality in epidemics was of the order of 30% when veterinary help arrived late. —A.S.

NOYAN, A. (1954). Koyunlarda piroplasmosis, theileriosis ve anaplasmosis'te kemik iliği biopsy'si. [**Bone marrow biopsy in diagnosis and study of piroplasmosis, theileriosis and anaplasmosis.**] — *Thesis, Ankara*. pp. 94. [Abst. from English summary.] 354

N. studied *Babesia*, *Theileria* and *Anaplasma* infections in sheep, taking bone marrow samples firstly at the onset of the disease, then 7-10 days later, and finally one month after taking the first sample. Quinuronium sulphate (acaprin) was effective against *B. ovis* infection, and caused the disappearance of the parasite from the bone marrow one day after injection. He found that blood samples were preferable to marrow samples in the diagnosis of acute infection, but that the latter were more useful for chronic infection.—A.S.

but generally his work was greatly hampered by lack of funds, a problem to which in 1924 a solution was found by making the institute a responsibility of the "Tierseuchenforschungsinstitut", an organisation brought into being in 1919 which had the task of developing agricultural sciences from funds subscribed by various provincial cattle and meat-marketing organisations. In 1924 a swine fever department was added and Waldmann's staff, now including among others Trautwein and Wegener, increased remarkably. There was a building boom between then and 1928 on the island. There were 12 large laboratories, a serum block, stables and byres to house over 800 horses and cattle, bleeding rooms, refrigeration plants, etc. The island was joined with the mainland by aerial rope way and there was a boat service.

The discovery of a third type of virus by Waldmann was followed in 1930 by Hecke's successful tissue culture and in 1938 by Nagel's cultivation of the virus in mouse brain. Attempts, however, to produce an effective vaccine from passaged material were still unsuccessful.

The aluminium hydroxide-adsorbed vac-

cine described by the Danish worker Schmidt was combined by Waldmann and Köbe in 1938, with the formolized vaccine described by Vallée. The result was a vaccine for which great success was claimed.

During the second world war Traub, known for his work on swine erysipelas, was appointed vice president [deputy director]. In 1943 the institute was put directly under the control of the German State government which provided ample funds.

The end of the war proved disastrous for the institute and practically all its equipment was lost. Two diagnostic laboratories however remained working. In April 1946 the German agricultural and forestry department in the Soviet occupied zone was ordered to take up production of Waldmann's vaccine with a target figure of 25,000 litres for 1946. Waldmann left in 1948 for the Argentine, taking two of his colleagues with him, and Traub returned to his home in South Germany. Dedié took over until the appointment of Röhrer, its present director. Soon after, the institute was turning out large amounts of swine erysipelas and F. & M. disease vaccines.

In 1950 the nearby island of Koos, measuring about 600 acres, was acquired and work expanded accordingly. Laboratories had been re-equipped with modern appliances including an electron microscope. In 1952 the total number of personnel was 405 and F. & M. disease vaccine production in 1951 amounted to 63,000 litres.—E.G.

SCHNEIDER, B. (1954). Über einen weiteren immunologischen Typ des Maul- und Klauenseuchevirus. [A further type of foot and mouth disease virus.]—*Berl. Münch. tierärztl. Wschr.* **67**, 218-220. [English summary.] **356**

S. referred to unpublished work by Gallo-way and others on the classification of South African F. & M. disease viruses. These workers have isolated a number of strains not belonging to any of the 3 standard types, and they have classified these under 3 new types which they named South African Types, 1, 2, and 3.

S. carried out various serological and immunological tests on a Rhodesian strain belonging to one of the new types. Out of 24 cattle highly immune to the 3 standard types, 20 were susceptible to the Rhodesian strain.—A.S.

HIRTZ, J. & CAMAND, R. (1954). Le comportement des trois types du virus aphteux au cours de l'électrophorèse dans l'amidon. [An electrophoretic study of three types of

foot and mouth disease virus.] — *Rev. Immunol.* **18**, 206-213. **357**

The authors found that the electrophoretic behaviour of a number of strains of A, B, and C [French types O, A, and C] type viruses indicated a mobility close to that of the β -globulins. Though none of the viruses was electrophoretically homogeneous, there were distinct and characteristic differences between the types, suggesting that the differentiation of the types, though based on immunological research, has a physico-chemical foundation.—A.S.

PALMA, E. E. & EPSTEIN, B. (1951). Observaciones histológicas sobre cultivos de tejidos en piel de fetos de bovinos con virus de la fiebre aftosa. [Histological study of lesions in tissue cultures on bovine foetal tissue of foot and mouth disease virus.]—*Rev. Med. vet., Montevideo.* **26**, 1244-1249. **358**

The authors described the cultivation of F. & M. disease virus on bovine foetal epithelium, and degenerative changes in the epithelium resulting from the presence of the virus.—A.S.

BRADISH, C. J., HENDERSON, W. M. & BROOKSBY, J. B. (1954). Electrophoretic studies of ox serum. I. The sera of normal cattle. II. The sera of cattle infected with the virus of foot - and - mouth disease.—*Biochem. J.* **56**, 329-335 & 335-341. **359**

BRADISH, C. J. & BROOKSBY, J. B. (1954). Electrophoretic studies of ox serum. III. The sera of cattle infected with the virus of vesicular stomatitis. — *Ibid.* 342-344. [Authors' summaries modified.] **360**

I. The sera of 51 normal Devon steers from 18 to 30 months old were analysed electrophoretically in a phosphate buffer of pH 7.6 and ionic strength 0.18. The mean electrophoretic distribution was found to be albumin, 46.6; α -globulin, 14.0; β -globulin, 8.9 and γ -globulin, 30.5%. The γ -globulin comprises at least three minor components. The authors presented the frequency distributions of these data.

The data for 30 of these steers indicated an absolute concentration of serum protein of 7.0 \pm 0.5 g./100 ml. A significant correlation was found to exist between individual values for the serum protein conc. and the electrophoretic distribution; the absolute conc. of serum albumin being maintained relatively stable close to 3.2 g./100 ml. despite much greater changes in the absolute conc. of the serum globulins.

II. The sera of 21 cattle were analysed electrophoretically during the course of infection with the virus of F. & M. disease. Six strains

of virus were employed and a regular development of the electrophoretic distribution was observed in all but one of the 21 series of sera.

In the serum of the 'average typical animal' the β -globulin rose from the normal level of 10 to about 14% on the seventh day following inoculation. The normal level of β -globulin was regained during the following week. The γ -globulin component increased from the normal level of 30 to about 40% during the third or fourth week and maintained this value with little change for several weeks.

The authors characterized the 3 minor components of the γ -globulin component by their mobility ranges. The observed increment in γ -globulin arose in the components of lowest mobility.

III. The sera of 4 cattle were analysed electrophoretically during the course of infection with the Ind. C. and N.J.M strains of the virus of vesicular stomatitis. An increase in γ -globulin of from 3 to 10% above the normal level was observed between the third and sixth weeks following inoculation.

A second inoculation of 2 cattle with the same type of virus (strain N.J.M) given 31 days after the first failed to induce any significant change in the electrophoretic distributions of sera collected within the following 22 days. Of 2 animals which received a second inoculation of a different type of virus (strain N.J.M) 53 days after the first (strain Ind. C.), the serum of only one showed a significant rise in the proportion of γ -globulin during the following 22 days.

The present data suggest that the electrophoretic changes in ox serum associated with the development of vesicular stomatitis are less pronounced and less regular than those associated with F. & M. disease.

BECK, W. & ZIMMERMANN, TH. (1954). Allergie bei MKS-Virusinfektionen. [**Allergic glossitis in cattle used for the production of foot and mouth disease virus.**]—*Berl. Münch. tierärztl. Wschr.* **67**, 101-104; 122-125. [English summary.] **361**

An account of further investigations [see *V.B.* **23**, 3055] into allergic glossitis in cattle used for F. & M. disease vaccine production. The authors bled animals which had developed allergic glossitis and infused various quantities of this blood, or serum from it, into 18 normal animals, which reacted with symptoms of shock and urticaria. When virus material was inoculated intralingually into these animals, 13 out of 18 developed glossitis, while the remainder gave no allergic response. There was no apparent

connexion between allergy and immunity to the virus: of 12 cows which developed glossitis 9 were susceptible to the virus and 3 immune (no information being given regarding the immunity or susceptibility of the 13th cow). The authors decided to carry out further work to determine whether or not the allergic antigen was type-specific.—A.S.

MACKOWIAK, C., GIRARD, H. & LANG, R. (1954). Procédés de conservation du virus aphteux de culture. [**Methods for preserving foot and mouth disease culture virus.**]—*Ann. Inst. Pasteur.* **87**, 465-468. **362**

The authors compared the loss of virulence of F. & M. disease tissue culture material when it was quickly or slowly frozen, either alone or suspended in glycerol or albumin. With albumin the virus conserved its virulence well; with glycerol, or alone, it lost much of or all of its virulence.—A.S.

BÖRGER, K., SEELEMAN, H. & MROWETZ, G. (1954). Der Einfluss der Maul- und Klauenseucheschutzimpfung auf die Milchqualität. [**Effect of foot and mouth disease immunization on the quality of milk.**]—*Milchwissenschaft.* **9**, 163-165. [English and French summaries.] **363**

The authors inoculated 4 healthy cows against F. & M. disease, and examined their milk at the 1st, 5th, 7th and 10th days. They found no significant change in the quality of the milk.—A.S.

I. MOLLARET, P., SALOMON, LOUIS & SALOMON, LÉONE. (1953). Une méningite humaine d'origine bovine (stomatite pseudo-aphteuse épizootique) et son ultra-virus. [**A human meningitis of bovine origin (epizootic pseudo-apthous stomatitis) and its virus.**]—*Bull. Soc. Méd. Hôp. Paris.* **69**, Nos. 28/29, pp. 923-931. **364**

II. MOLLARET, P., SALOMON, LOUIS & SALOMON, LÉONE. (1953). La découverte d'une nouvelle méningite à virus d'origine vétérinaire (stomatite pseudo-aphteuse épizootique des bovidés). I. La maladie humaine. II. La maladie vétérinaire. [**Discovery of a new meningitis caused by the virus of epizootic pseudo-apthous stomatitis of cattle. I. The disease in human beings. II. The disease in animals.**]—*Pr. méd.* **61**, 1615-1617 & 1715-1718. **365**

III. MOLLARET, P., SALOMON, LOUIS & SALOMON, LÉONE. (1954). [**A stomatitis resembling foot and mouth disease, in cattle, and a new**

human meningitis, caused by the same virus.]
—*Delt. Hellen. kten. Hetair.* 2, 541-546. [In Greek. French summary.] 366

I. The authors had previously described the isolation of a virus from "epizootic pseudophthous stomatitis" of cattle, and from meningitis in workers in a veterinary laboratory [*V.B.* 24, 89 & 425]. In the present paper they described in greater detail the clinical features of human infection, and the animal and serological experiments by which they established that the virus which caused meningitis in man was the same as that isolated from the disease in cattle.

II. The first part of this paper contained a clinical account of meningitis in 4 laboratory workers, as described above. In the second part the authors described, and gave photographs of, the disease in cattle and in laboratory animals. In cattle, the lesions were present only on the muzzle, lips, gums, and (rarely) tongue. They commenced as small papules, 1-2 mm. diam., not easily detachable from the skin; they differed from the lymph-containing vesicles of F. & M. disease. Eventually the papules reached a size of 1-2 cm. diam., and they often became confluent. At this stage healing took place by cicatrization within 3-4 weeks, unless there was secondary infection. Apart from a rise in body temp. lasting for 48 hours, no other symptoms were observed in infected cattle, and there was no loss of appetite.

The authors gave further details of transmission of the virus to new-born mice and rats, and in chick embryos. Horses and sheep were not susceptible. The disease differed from Armagh disease and from erosive stomatitis described by Mason & Neitz [*V.B.* 12, p. 579].

III. A general account of the work described above.—R.M.

MÁLAGA-ALBA, A. (1954). **Vampire bat as a carrier of rabies.**—*Amer. J. publ. Hlth.* 44, 909-918. [Author's summary modified.] 367

Vampire bats have been known to exist since the early discovery of America and for the past 45 years they have been known to transmit paralytic rabies to livestock. The vampire bat, *D. rotundus*, has a wide distribution and its range extends from Argentina and Chile (parallel 30°, Latitude S.) to Potan, Sinaloa (parallel 28°, Latitude N.). Thus far, the nearest locality to the United States border where vampire bats have been found is Guadalupe Cave near Linares, Nuevo Leon, only 100 miles from the border. Rabies in vampire bats may manifest itself in the classical furious or paralytic type common to all mammals, or may re-

semble rabies in birds, or the bat may develop a carrier state without showing any symptoms. The latter state has been observed in nature and has been reproduced in experimentally infected bats.

By repeated passages through the bat the rabies virus becomes modified in its pathogenicity, developing a species specificity. The virus is of low virulence but of high invasiveness; it shows greater pathogenicity for cattle and other domestic animals. Dog and man are decidedly less susceptible to this strain. Transmission of rabies to human beings by vampire bats has only been reported in Trinidad and Mexico. The high susceptibility of some animals to the vampire bat rabies strain and the low susceptibility of man and dog has considerable epidemiological importance, because, although the public health hazard is not so great, it does not minimize the possible danger of the bat as a rabies carrier.

NELSON, E. A. & ANDERSON, H. D. (1953). **Potencies of phenolized rabies vaccine improved by addition of merthiolate during inactivation.**—*Appl. Microbiol.* 1, 135-137. [Authors' summary modified.] 368

The authors described a method for the production of phenolized rabies vaccines of high antigenic value. Improved potencies were obtained when thiomersal was added immediately following the addition of phenol. The potencies of these vaccines were comparable to those obtained using ultraviolet irradiation, and they have not caused serious reactions in human beings.

BUDDINGH, G. J. (1953). **The nomenclature and classification of the pox group of viruses.**—*Ann. N.Y. Acad. Sci.* 56, 561-566. 369

B. discussed the criteria according to which Goodpasture delimited the Borreliota or pox group of viruses (morphological characters; reaction to Morosov's silver stain; the presence in parasitized cells of cytoplasmic inclusions, of which the elementary body is the essential component; and serological and immunological reactions). Subsequent work with the electron microscope has confirmed Goodpasture's work, revealing that a brick-like structure within a certain range of size is characteristic of the group.

B. described a number of viruses which resembled the pox viruses by certain of the criteria, though not all of them: varicella and herpes zoster, for instance, have a brick-like structure, but do not stain with Morosov's sil-

ver stain, and the cutaneous eruption which they produce is of a different nature.

He considered serological reactions to be very valuable in establishing interspecific relationships between viruses, though it was seldom that a single antigenic component was common to an entire genus. The pox viruses were well suited to classification on a serological basis. He presented an enlarged and somewhat revised classification for these viruses, based on the points brought out in his discussion.—A.S.

MANTOVANI, A. (1954). Coltura del virus del diftero vaiolo dei polli e dei piccioni in uova embrionate di pollo. Preparazione di un vaccino. [**Cultivation of the viruses of fowl pox and pigeon pox in chick embryos. Preparation of a vaccine.**]—*Riv. Med. vet., Parma*. 6, 57-64. [English, French and German summaries.] 370

A conventional account. [See also *V.B.* 9, p. 712; 10, p. 929; 12, p. 491; & 22, abst. 395].—R.M.

VERGE, J. (1954). La vaccination contre l'affection diphthéro-variologique des oiseaux et les vaccinations associées. [**Fowl pox vaccination and combined vaccination against other diseases of fowls.**]—*Papers presented to Xth World's Poult. Congr., Edinburgh, 1954*. pp. 240-242. [In French. English and French summaries: p. 47 of Summaries of Section Papers.] [Author's summary modified.] 371

The author described the principles underlying active immunization procedures against fowl pox, and the results obtained in the past with both virulent and modified viruses (homologous or heterologous). He recommended the use of a multiple vaccine against both fowl pox and Newcastle disease. The method must be used with caution, and necessitates the preparation of mixed antigens which are at the same time effective and harmless.

CILLI, V. & DAVOLI, R. (1954). Comportamento del bovino all'infezione sperimentale da virus dell'influenza umana. [**Experimental infection of cattle with the virus of human influenza.**]—*Clin. vet., Milano*. 77, 129-136. [English summary.] 372

The authors administered human influenza virus type A or type B, in the form of lung suspensions from infected rats or allantoic fluid from infected chick embryos, by the intratracheal, the nasal, or the conjunctival route to 6 calves, 8-10 months old. The calves showed a mild reaction, consisting of a transient rise in body temp. and an increase in the number of

leucocytes in the blood, lasting for up to 18 days after infection. Blood from 2 of them was positive to haemagglutination-inhibition tests 9-11 days after infection; the remainder were negative or doubtful.—R.M.

MELLANDER, O. & ÖBERG, G. (1952). **Antibody formation and nutrition. I. Antibody titre in sucking and artificially fed lambs inoculated with influenza virus.**—*Acta Soc. Med. Upsaliensis*. 57, 469-472. [Authors' summary slightly modified.] 373

Seven sets of twin lambs were inoculated with type A influenza virus. One of each pair of twins was allowed to suck the ewe and the other was fed with a preparation of cow's milk having the same quantitative composition as ewe's milk. The antibody titre of suckled lambs was higher than that of bottle-fed lambs.

SABIN, A. B. (1953). **Relationships between arthropod-borne viruses based on antigenic analysis, growth requirements, and selective biochemical inactivation.**—*Ann. N.Y. Acad. Sci.* 56, 580-582. 374

S. began with the assumption that animal viruses which are transmitted by arthropods, and which multiply in arthropods, are all members of a single family. From this 'family' he selected all members having a size of 15 to 25 μ , considering them as a 'tribe' within the 'family'. He then showed how classification within this 'tribe' might be based on antigenic analysis, growth requirements, and selective biochemical inactivation.—A.S.

HAMMON, W. MCD. (1953). **Possible classification of the arthropod-borne encephalitis viruses.**—*Ann. N.Y. Acad. Sci.* 56, 568-573. 375

H. considered the difficulties of attempting a Linnaean classification of the arthropod-borne encephalitis viruses at the present time. The application of this classification would involve a considerable knowledge of the viruses, particularly with regard to their morphology and methods of reproduction; chemical constitution and physical properties; immunological properties; susceptibility to physical and chemical agents; natural methods of transmission; host, tissue and cell tropisms; pathology, including the formation of inclusion bodies; and symptomatology. Little of this required knowledge is yet available, so that any classification evolved now would probably require extensive alteration in future years, and involve unnecessary confusion.

He advocated waiting until the time is ripe for action, and commented that the present sys-

tem, though incomplete, is simple, and has the advantage of discouraging a multiplicity of names.—A.S.

WENCKEBACH, G. K. (1952). Das Marwenvirus. Ein neuer Erreger von Encephalomyelitis. [**Virus encephalomyelitis in the nutria** (*Myopotamus coypu*).—*Klin. Wschr.* **30**, 564. **376**

A note on the properties of the virus isolated by W. from encephalomyelitis in *M. coypu*. [See also *V.B.* **22**, 2813].—R.M.

GOERTTLER, V. & VÖHRINGER, K. (1954). Die Behandlung der Bornaschen Krankheit der Pferde mit Sulfonamiden. II. [**Treatment of Borna disease in horses with sulphonamides. II.**—*Mh. VetMed.* **9**, 245-252. **377**

The authors discussed symptoms and prognosis. They cured 227 out of 501 infected horses (45%) by sulphonamide therapy. There were no controls, but they stated that Borna disease, when not treated, is usually fatal for 77-90% of infected horses.—A.S.

LEHNERT, E. & VIRIDÉN, P. (1954). Kritische Bemerkungen zu der von Altara, Serra und Guarini zur Diagnose der infektiösen Pferdeanämie empfohlenen Komplementbindungsmethode. [**A complement-fixation test for diagnosis of equine infectious anaemia.**—*Nord. VetMed.* **6**, 707-716. [In German. English and Swedish summaries.] [Abst. from English summary.] **378**

The authors tested the modified complement-fixation method described by Altara *et al.* [see *V.B.* **24**, 1875 & 3140] for the diagnosis of equine infectious anaemia. They concluded that the method recommended by those authors is useless for the diagnosis of E.I.A. as it causes diagnostic errors, and that the phenomenon which those authors considered a specific complement fixation had apparently nothing to do with an antibody-antigen reaction, but was due to non-specific factors. Normal sera with E.I.A. antigen, or E.I.A. sera with spleen extract from a normal horse in fact showed the same phenomenon of delay of the haemolysis as E.I.A. sera with E.I.A. antigen.

MÖHLMANN, H. (1954). Eine Auswertung von Tierversuchen im Hinblick auf die Möglichkeit des Vorkommens stummer Infektionen bei der infektiösen Anämie der Pferde. [**Diagnosis of latent equine infectious anaemia.**—*Arch. exp. VetMed.* **8**, 217-225. **379**

Seven horses were exposed to infection by spraying either their eyes and nasal mucosa or

the hay with small amounts of serum infected with the virus of equine infectious anaemia, or by s/c inj. of either sediment or supernatant fluid from infected urine which had been treated with aluminium hydroxide. None of the horses developed clinical symptoms of E.I.A., but incubation periods following subsequent s/c inj. of 10-20 ml. of serum containing virulent virus averaged 27 days instead of 9 days as in controls. From these experiments M. concluded that there are two distinct forms of infection without symptoms, the latent form leaving the horse immune to subsequent infection and the one described above producing only incomplete immunity.—E.G.

TOPOLNIK, E., KUTLESA, I., AUDI, S., ALERAJI, Z. & BEGANOVIĆ, A.-H. (1954). L'avortement infectieux des juments en Yougoslavie. [**Virus abortion of mares in Yugoslavia.**—*Bull. Off. int. Epiz.* **42**, May. pp. 365-367. [English summary.] **380**

A note reporting the occurrence of virus abortion in mares in Croatia and Bosnia.—A.S.

RECEVEUR. (1954). Animaux sauvages dans la transmission des maladies contagieuses, sauf la rage. [**Wild animals and the spread of infectious diseases other than rabies.**—*Bull. Off. int. Epiz.* **42**, May. pp. 213-222. [English summary.] **381**

A general note on the role of wild animals in spreading disease, particularly rinderpest in Central Africa.—A.S.

SCOTT, G. R. (1954). Thermal reactions of Kenya cattle vaccinated with lapinized rinderpest virus. [Correspondence.]—*Nature, Lond.* **174**, 44. **382**

S. analysed 5,925 morning temperatures from 444 cattle, including 113 uninoculated controls, in a study of the thermal reaction of Kenya cattle to lapinized rinderpest virus. The temperatures of the vaccinated and control cattle were the same except on the 5th, 6th and 7th days after vaccination, when there was a significant rise in the vaccinated animals. He considered that the dictum "no reaction, no immunity" might therefore be considered to hold with this, as with other types of live rinderpest virus vaccination.—A.S.

ILLARTEIN, P. R. & GUERRET, M. (1954). Contribution à l'étude de la prophylaxie de la peste bovine en Guinée française (A.O.F.). Note sur des essais de vaccination de taurins N'dama au moyen de la souche de virus pestique lapinisé Nakamura III. [**Rinderpest**

immunization with lapinized virus in French Guinea.] — *Bull. Soc. Pat. éxot.* 47, 422-434. 383

The authors investigated the suitability of lapinized rinderpest vaccine for N'Dama cattle in French Guinea. The vaccine was tolerated in s/c injections up to ten times the standard dose, and afforded protection against inoculation with virulent virus 84 hours after vaccination. The quick action of the vaccine made it especially suitable for limiting the spread of epidemics.—A.S.

PELLISSIER, A. & ROUSSELOT, R. (1954). Enquête sérologique sur l'incidence des virus neurotropes chez quelques singes de l'Afrique équatoriale française. [**Rift Valley fever antibodies in monkeys in French Equatorial Africa.**] — *Bull. Soc. Path. exot.* 47, 228-231. 384

The authors used a complement-fixation test in a survey of virus antibodies in 122 captive monkeys of 12 species in Brazzaville. Twelve monkeys of 7 species had antibodies to Rift Valley fever virus, 6 of 3 spp. had antibodies to Mengo virus, 10 of 5 spp. had antibodies to Bwamba virus, and 2 of one species had antibodies to Uganda S. virus.—A.S.

MC EWEN, A. D. & FOGGIE, A. (1954). **Enzootic abortion of ewes. Comparative studies of different vaccines.** — *Vet. Rec.* 66, 393-397. [Authors' conclusions slightly modified.] 385

A single s/c injection of an adjuvant vaccine prepared from infected ovine foetal membrane tissue precipitated by alum and emulsified in mineral oil stimulated the production of complement-fixing antibody and virus-neutralizing antibody in the sera of sheep. These antibodies persisted for a period of 425 days, the longest period over which tests have been made.

A single s/c injection of the vaccine is suitable for use in the field. When a "watery" vaccine was used in the field [see *V.B.* 23, 1559] it was the practice to revaccinate yearly those ewes which were to be kept in the flock for two or more lambing seasons. The evidence submitted suggests that the prolonged immunity following an injection of the adjuvant vaccine may make revaccination at yearly intervals unnecessary. Whether revaccination at longer intervals is desirable may only be ascertained by further work.

PERUMAL PILLAI, C. (1953). **Contagious pustular dermatitis of goats in Ceylon.**—*Reporter, Ceylon.* 1, No. 2. pp. 10-13. [Mimeographed.] 386

The common occurrence in various parts of

Ceylon of a disease of goats clinically resembling contagious pustular dermatitis in sheep is reported. It is not stated whether the disease also occurs in sheep. The clinical features are described. A study of the virus is being made and a further report is to appear.—M.C.

BREHM, R.-L. (1954). Erfahrungen in der Behandlung der Hard pad disease (Hartbal-lenstaupe) mit den Rhodanwasserstoffsäure-Präparaten Othomin und Rhodoforman. [**Treatment of hard pad disease with thiocyanic acid compounds.**]—*Berl. Münch. tier-ärztl. Wschr.* 67, 175-176. 387

Of 88 dogs with hard pad disease which were treated with one or the other of two commercial thiocyanic acid preparations 45 were cured, 36 died or had to be destroyed, and concerning the remaining 7 no information was available.—A.S.

SCHULZE, W. (1954). Zur Behandlung der sog. "Katzenstaupe" mit Streptomycin, Aureomycin und Chloromycetin. [**Treatment of feline distemper (? feline enteritis) with streptomycin, aureomycin and chloramphenicol.**]—*Mh. VetMed.* 9, 146-149. 388

S. discussed the somewhat misleading term "Katzenstaupe" (feline distemper) which is loosely used to cover several conditions—(a) infectious gastro-enteritis caused by a virus; (b) infectious agranulocytosis, considered by some workers to be very close to the gastro-enteritic form; (c) a contagious infection of the lungs often associated with bronchitis, tracheitis, laryngitis and rhinitis, and probably caused by a virus, though this is not certain; and (d) infectious laryngo-enteritis, also probably caused by a virus. In 3 years of experience, mostly with the enteritic form, he had found symptomatic treatment ineffective. Streptomycin by mouth gave good results, but it was ineffective by intramuscular injection. Aureomycin given by mouth had little effect.—A.S.

DAESCHNER, C. W., SALMON, G. W. & HEYS, F. M. (1953). **Cat-scratch fever.**—*J. Pediat.* 43, 371-384. 389

An account of cat-scratch fever in 12 human beings in South Texas, U.S.A.—R.M.

ANDREWES, C. H. (1954). **Myxomatosis in Britain.**—*Nature, Lond.* 174, 529-530. 390

A general note on the history of myxomatosis in S. America, Australia, France and Gt. Britain, including a discussion on the vectors concerned in its spread in these different regions. The author pointed out that a relationship in which a parasite kills 99% of its hosts

is not likely to be stable: the rabbit will very probably develop a resistance to the virus such as is possessed by the native rabbit of Brazil (*Sylvilagus brasiliensis*), its original host.—A.S.

COLOMO DE LA VILLA, G. (1954). La myxomatose en Espagne. [**Myxomatosis in Spain.**] —*Bull. Off. int. Epiz.* 42, May, pp. 765-766. 391

The author reported that, at the time of writing, only one case of myxomatosis had been confirmed in Spain. This was in a domestic rabbit in a village near the French border. The government was providing Shope's fibroma vaccine free to breeders near the French border and along the east coast.—A.S.

SIEGMANN, O. & WOERNLE, H. (1954). Erstes Auftreten der Kaninchenmyxomatose in Deutschland. [**First occurrence of rabbit myxomatosis in Germany.**] — *Tierärztl. Umsch.* 9, 1-3. 392

A note describing the P.M. examination of 3 rabbits with myxomatosis, which were found in the district of Mannheim at the end of August 1953.—A.S.

LOCKLEY, R. M. (1954). The European rabbit-flea, *Spilopsyllus cuniculi*, as a vector of myxomatosis in Britain.—*Vet. Rec.* 66, 434-435. 393

In a survey of myxomatosis in Nature Conservancy reserves in Sussex, Kent and East Anglia, L. found live fleas in the fur of the underside of dead rabbits, even in snowy weather. Using fleas from wild rabbits which had died from the disease 2-8 days before, he attempted to transmit infection to domestic rabbits. In 7 out of 10 attempts, when from 6-35 fleas were used, the rabbits died after 10-13 days, but in the remaining 3 attempts, where 4 fleas or less were used, the rabbits remained free from infection.

Corvine birds feed on infected rabbits immediately after their death, and may possibly carry infected fleas over considerable distances.—A.S.

RODOT, M. (1953). Le virus des pestes aviaires chez les mammifères et chez l'homme. [**Susceptibility of man and mammals to the viruses of fowl plague and Newcastle disease.**]—*Thesis, Paris (Alfort)*. pp. 88. 394

R. reviewed the behaviour of the viruses of fowl plague and Newcastle disease in various mammals and in man. Fowl plague virus does not produce spontaneous infection in mammals, but hedgehogs, ferrets, pigs and monkeys, and more particularly rats, mice and g. pigs develop

either neurotropic or generalized infection when inoculated intracerebrally. Artificial infection with Newcastle disease virus (N.D.V.) can be set up in various mammals, including rats, mice, sheep and pigs, and the virus can be serially passaged in rhesus monkeys and hamsters, in which it produces meningo-encephalitis. N.D.V. is essentially neurotropic, while fowl plague virus may give rise to either neurotropic or generalised infections. N.D.V. can infect man spontaneously, producing conjunctivitis.—A.S.

WOERNLE, H. & SIEGMANN, O. (1954). The importance of the demonstration of specific antibodies in dead birds and of effective vaccination in the general control of fowl pest.—*Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 237-240. [English and French summaries: p. 47 of Summaries of Section Papers.] 395

The authors described a method for the demonstration of Newcastle disease antibodies in carcasses submitted for diagnosis, giving full details of the test. [See also *V.B.* 23, 1258 & 24, 2364]. Its value lay in confirming tentative diagnosis based on pathological findings.—R.M.

TOPOLNIK, E. & HALLAUER, C. (1950). Pseudopest der Hühner: Interferenz zwischen Virus und Antikörper. [**Newcastle disease: interference between virus and antibodies.**]—*Schweiz. Z. Path. Bakt.* 13, 593-601. 396

The demonstration of Newcastle disease virus in the serum of experimentally infected fowls by the haemagglutination-inhibition test was only exceptionally positive: with the organs of infected fowls results were not constant. The demonstration of N.D. antibodies in serum and organs by the H.I. test and by the rapid agglutination test described by Zargar & Pomeroy (1949) succeeded in fowls which had been infected 5 days or more previously.—R.M.

MONTI, G. (1954). Comparazione fra gli anticorpi inibenti la emoagglutinazione e gli anticorpi neutralizzanti presenti nel tuorlo di uova di galline vaccinate e iperimmunizzate nei confronti della pseudopeste. [**Comparison between haemagglutination-inhibiting and virus-neutralizing antibodies in egg yolk of fowls vaccinated and hyperimmunized against Newcastle disease.**]—*Clin. vet., Milano.* 77, 74-78. [English summary.] 397

When compared with that of the blood, the titre of Newcastle disease virus-neutralizing antibodies was very low in the yolk of eggs from fowls which had been vaccinated with formulated fowl embryo vaccine or with live attenu-

ated virus. On the other hand, haemagglutinating antibodies were present in almost equal concentrations in the blood and egg yolk. M. concluded that chicks hatched from the eggs of fowls which had been vaccinated with attenuated N.D. virus possessed no immunity against the disease.—R.M.

BUCK, G., QUESNEL, J. J. & RAMAMBAZAFY, H. D. (1954). Expériences d'inoculation du porc avec le virus de la maladie de Newcastle. [Experimental passage of Newcastle disease virus in the pig.] — *Ann. Inst. Pasteur*, **87**, 450-457. 398

Newcastle disease virus (N.D.V.), inoculated intracerebrally (i/c) into piglets, produced symptoms of paralysis. The virus was not at first infective to piglets by the nasal route, but became so after 5 passages i/c. Piglets immune to Teschen disease were also immune to N.D.V. inoculated i/c. N.D.V., passaged i/c in piglets, lost its pathogenicity for fowls after the 2nd passage.—A.S.

PLACIDI, L. (1954). Transmission du virus de Newcastle au hérisson. [Experimental infection of the North African hedgehog (*Aethichinus algirus*) with Newcastle disease virus.] — *Ann. Inst. Pasteur*, **87**, 236-238. 399

P. transmitted the virus of Newcastle disease to hedgehogs by injecting infective material into the brain and peritoneum, and also by allowing one hedgehog to eat the carcass of another which had died from the disease. It is possible therefore that the North African hedgehog may under natural conditions serve as a reservoir of the virus.—A.S.

CRAWLEY, J. F. (1954). Immunisation of chickens against infectious bronchitis and Newcastle disease by the spray method.— *Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954, pp. 234-237. [English and French summaries: pp. 46-47 of Summaries of Section Papers.] [Author's summary modified.] 400

C. described the advantages, the limitations and the practical application of the spray method of immunization of chickens against infectious bronchitis and Newcastle disease. Using this means of vaccination it is possible to immunize effectively, and with a minimum effort, large numbers of birds against both diseases at the same time.

The effective control of either infectious bronchitis or Newcastle disease starts in breeding flocks. Proper immunization of these birds not only safeguards production of eggs and chicks through prevention of natural infections

during the hatching season but also it provides passive protection (parental immunity) for the young chicks. Since the parental immunity persists for only 2-3 weeks it is advisable to vaccinate the young chicks when newly hatched. Vaccination at 2-3 days of age with the combined vaccine caused no disturbance in the growth rate and no mortality in chicks which possessed parental immunity to infectious bronchitis. Revaccination by the spray method against Newcastle disease alone should be undertaken at 5-6 months of age for all replacement stock. Similarly breeding flocks previously vaccinated when newly hatched may be revaccinated against infectious bronchitis if high parental immunity is desired in their offspring. C. claimed that the spray method of immunization against these two respiratory diseases stimulated a more uniform and a higher immunity than that produced by the same strains administered by the ocular, intranasal or intramuscular routes.

PULSFORD, M. F. (1954). Variation in the virus of infectious laryngotracheitis and its epizootological implications.— *Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954, pp. 242-244. [English and French summaries: pp. 47-48 of Summaries of Section Papers.] [Author's summary copied verbatim.] 401

Infectious laryngotracheitis (I.L.T.) was first recognised as an epizootic disease in the United States of America in 1923. Although it was found in many parts of North America within very few years, attempts to trace its spread yielded little information, but the evidence suggested that it had been enzootic for a number of years. By the time the disease was recognised in two Australian states in 1935, a great deal was known of its behaviour as a result of American experience. In New South Wales attempts to trace the origin were unsuccessful and a similar history of earlier enzootic occurrence was obtained. In Victoria the virus was isolated before any epizootic was known to have occurred and serological evidence showed that it had been present for some time. Despite a careful watch in other Australian states I.L.T. was not reported until 1948 in Western Australia and 1950 in South Australia. In the latter state, serological evidence of previous infection was found in approximately 50 per cent. of flocks throughout the state.

The history of the appearance and increase of I.L.T. throughout the world has led many workers to believe that the disease is not new, but has only recently been differentiated from

other respiratory diseases. At the time of the first isolation of I.L.T. virus in Victoria and South Australia, studies showed quantitative antigenic differences in the reaction of virus from epizootic and enzootic areas. An analogy is drawn in the present papers between these differences and the phase variations in influenza and bacteriophage. It is suggested that the epizootic form of I.L.T. is a new disease, being the result of a phase variation or mutation in which the epizootic phase has been favoured by mass production methods in the poultry industry.

PENNIMPEDE, F. C. (1950/53). Viabilidad de las suspensiones de virus conservadas a -76°C . [Viability of viruses at a temperature of -76°C .]—*Rev. Inst. bact. B. Aires*, **15**, 87-91. 402

P. studied the viability of a number of strains of influenza virus and various neurotropic viruses after they had been stored for long periods at -76°C . The viruses, contained in infected tissues, had been either desiccated or placed in glycerol before storage. All of them, tested on rats, showed considerable powers of survival. For example poliomyelitis virus (Lansing strain) could survive at least 5 years and 10 months, Japanese B encephalitis 8 years, and Semliki Forest virus 3 years and 9 months.—A.S.

I. MÖHLMANN, H. & GRALHEER, H. (1954). Größenbestimmung des Virus der infektiösen Anämie der Einhufer durch Ultrafiltration. [Determination of the size of equine infectious anaemia virus by ultrafiltration.]—*Arch. exp. VetMed*, **8**, 199-203.

II. BINDRICH, H. & GRALHEER, H. (1954). Untersuchungen zur Größenbestimmung des Virus der experimentellen Hundestaupe. [Determination of the size of dog distemper virus by ultrafiltration.]—*Ibid.* 204-211. 403

I & II. Size of the virus of equine infectious anaemia was established by ultrafiltration as 60-95 $\text{m}\mu$ and the size of the dog distemper virus as 70-105 $\text{m}\mu$.—E.G.

ZINK, A. (1954). Fortschritte in der Virusforschung und ihre praktische Bedeutung für die Veterinärmedizin. [Recent progress in research on viruses and its practical importance for veterinary medicine.]—*Schweiz. Arch. Tierheilk.* **96**, 312-326. [English, French and Italian summaries.] 404

A note on research into Newcastle disease, canine distemper, rabies and swine fever, by a private firm (Lederle).—A.S.

ANDRIANNE, V. F. (1953). Considérations sur les images virales révélées par le microscope ordinaire. Les corpuscles élémentaires et les inclusions. La méthode des décalques. La coloration de Frottingham. [Elementary bodies and cell inclusions in virus diseases.]—*Ann. Méd. vét.* **97**, 275-289. 405

The author described a technique for making impression preparations from tissues containing virus, and for staining them.—A.S.

ITIKAWA, O., OGURA, Y. & KATADA, S. (1954). Shadow casting of stained virus bodies to enhance visibility by light microscopy.—*Stain. Tech.* **29**, 175-178. [Authors' abst. modified.] 406

Materials used for study were virus smears or very thin sections containing virus inclusion bodies. They were stained by the Feulgen method or other cytochemical procedures. After staining, preparations were placed in a vacuum in a bell jar and exposed to shadow-casting with metallic chromium vapour for 30 sec. at an angle of 10° - 12° . Preparations were then cleared in xylene and mounted in Canada balsam. Objects treated with this shadow casting procedure were rendered much more visible when examined by visible light microscopy.

LEY, H. L., JR. & SMADEL, J. E. (1954). Antibiotic therapy of rickettsial diseases.—*Antibiot. & Chemother.* **4**, 792-802. [Spanish summary: p. 826.] 407

Chloramphenicol, chlortetracycline and oxytetracycline are effective in the treatment of human rickettsial diseases. The authors reviewed the treatment of 588 cases of various rickettsial diseases, in different parts of the world. No deaths were reported among patients who received antibiotic therapy before the terminal stages of disease.—A.S.

ANON. (1954). Report of the subcommittee on viruses (1953).—*Int. Bull. bact. Nom. Taxon.* **4**, 109-114. [Mimeographed.] 408

The subcommittee on viruses of the International Committee on Bacteriological Nomenclature reiterated the conclusions of the 1950 meeting, laying down that at present "the use of systems of classification for, and application of binomials to viruses as a whole are undesirable and should be discouraged." They proposed, however, that names put forward by the study groups and accepted by the committee should be used as a provisional international nomenclature, and that only these names should have official status. A list of accepted virus groups and members was given, groups being

equivalent to Linnaean genera, and members equivalent to species.

The study group concerned with the Chlamydozoaceae considered that these organisms belonged with the Rickettsiales.—A.S.

RAKE, G. (1953). *The lymphogranuloma-psittacosis group*. — *Ann. N.Y. Acad. Sci.* **56**, 557-560. 409

R. discussed the Lymphogranuloma-Psittacosis group, and gave reasons for placing them with the rickettsia rather than with the viruses. He considers that the time is opportune for classifying the group, provided that the nomenclature is recognized to be elastic and open to question in the light of any new findings. Taken in this spirit, a classification of the group at the present time would certainly be a stimulus to research, and not a hindrance. —A.S.

I. RAKE, G. W. (1953). *Possibilities of generic classification in rickettsiae and viruses*. — *Ann. N.Y. Acad. Sci.* **56**, 439-441. 410

II. SMADEL, J. E. (1953). *The Viral and Rickettsial Registry, U.S.A.* — *Ibid.* 612-614. 411

III. COLES, J. D. W. A. (1953). *Classification of rickettsiae pathogenic to vertebrates*. — *Ibid.* 457-483. 412

I. R. stressed the importance of working out a classification for the viruses, pointing out that an agreed system is desirable on grounds of general convenience, and particularly so where work published in different languages has to be collated. He considered that of the various alternatives the Linnaean system, based on evolution, is the only one calculated to bring together and increase knowledge of the viruses and rickettsia.

See also absts. 283 (bacteriophages from soil); 300 (contamination of fowl pox vaccine by *S. pullorum*); 495 (differentiation between Newcastle disease and corn cockle poisoning in poultry); 550 (report, Nyasaland Protectorate); 551 (report, Belgium).

IMMUNITY

I. DELAUNAY, A. & DE ROQUEFEUIL, C. (1954). *Modifications apportées par le salicylate de sodium et des corps divers à l'aspect physique de sérums normaux ou d'immunsérums. [Action of sodium salicylate on the physical properties of normal and immune serum.]* — *Rev. Immunol.* **18**, 230-251. 413

II. DELAUNAY, A. & DE ROQUEFEUIL, C. (1954). *Modifications apportées par le salicylate de sodium et des corps divers à des réactions de précipitation antigène-anticorps. [Action of sodium salicylate and other sub-*

stances on antigen-antibody reactions.] — *Ibid.* 252-264. 414

In other organisms morphology is the prime consideration in classification, but, with the present techniques of research, this could not be so with the viruses. He considered however that size, serological characters, chemical and physical characters, tissue tropism and invertebrate transmission—perhaps in that order of importance—should be the criteria of virus classification.

He mentioned the groups Borrelia (pox viruses) and Miyagawanellae (agents of psittacosis-lymphogranuloma), as being in his opinion worthy of generic status.

He thought that the system would be more useful if taxonomists would avoid as far as possible the tendency towards the "splitting" of genera.

II. S. gave a brief account of the Viral and Rickettsial Registry, an organization recently set up in the U.S.A. to maintain a stock collection of virus strains, with particular emphasis on strains commonly used in teaching and research. At the present time the American Type Culture Collection is housing the Registry and distributing the viruses. S. gave a list of the strains currently available, commenting that a number of virologists outside the U.S.A. have already made use of the service.

III. C. considers the rickettsia to be specialized and highly pleomorphic bacteria. He sees no justification for separating the Chlamydozoaceae from the Rickettsiaceae on the sole ground that the latter are transmitted by arthropods, and suggests that in any case the name Chlamydozoaceae should be allowed to lapse because of its undesirable animal associations. After a discussion of pleomorphism he stated his belief that there is no definite life cycle. He proposed a tentative classification for the Rickettsiaceae.—A.S.

Under similar conditions and at corresponding molecular concentrations sodium orthoaminobenzoate, orthonitrobenzoate, orthoiodobenzoate and gentisate also gave gels, but these were not so stable as those obtained with

the salicylate. Urea and chlorhydrate of guanine were also less active than sodium salicylate in forming gels with horse serum.

Human, bovine and sheep serum also formed gels with sodium salicylate.

Serum from vaccinated animals formed gels more rapidly than that from unvaccinated animals.

II. The authors observed the effect of sodium salicylate and the other substances mentioned [*I supra*] in inhibiting precipitation when in the presence of an antigen/antibody system (rabbit serum-horse antiserum with horse serum) *in vitro*. They discussed the nature of this inhibition.

In a second series of experiments they studied the behaviour of the same antigen/antibody system, with the difference that in this case the antibody had previously been treated with one or other of the substances mentioned and then dialysed to remove the substance. This method was devised to show whether, for each of the substances, the inhibition of precipitation brought about was due to a denaturing action on the antibody, or whether it was simply that their hydrotropic action caused the precipitate to redissolve as it formed. Sodium salicylate, sodium benzoate, sodium gentisate and *p*-aminosalicylate, and antipyrine all, in various degrees, denatured the antibody, as shown by the reduced precipitation which occurred when it was added to the antigen.

When the antigen (horse serum) was likewise treated with sodium salicylate and dialysed before being added to the antigen, there was greatly increased precipitation. This the authors attributed to denaturation of a different

sort. The action of the other substances on the antigen was not examined.—A.S.

BAGDY, D. & SZILÁGYI, T. (1953). **Mammalian specificity of fibrinogen.** — *Experientia*, **9**, 104-106. **415**

There were close antigenic relationships, as judged by precipitin tests and by anaphylactic reactions in pigeons, between fibrinogens from human beings, horses, cattle, sheep and pigs. Fibrinogen from fowls differed in its antigenic properties from that of mammals.—R.M.

EBEL, K.-H. (1953). **Papierelektrophoretische Untersuchungen der Bluteiweissverhältnisse bei Hunden, Rindern und Kälbern. [Paper-electrophoretic examination of the plasma proteins in dogs, cattle and calves.]** — *Zbl. VetMed.* **1**, 70-76. [English and French summaries.] **416**

In paper chromatography studies on serum from healthy and sick dogs E. noted that illness was accompanied by a decrease in the albumin fraction of the blood plasma and an increase in the globulin fraction. None of the diseases he studied produced characteristic electrophoretic patterns.

Observations on calves confirmed a rise in γ -globulins after the ingestion of colostrum.

—A.S.

COHEN, C. & FULLER, J. L. (1953). **The inheritance of blood types in the dog.** — *J. Hered.* **44**, 225-228. **417**

Inheritance in dogs of the blood groups A, B, C, D and E described by Young and others [*V.B.* **22**, 138 & 1382] followed the pattern of simple Mendelian dominants, with no evidence of linkage or multiple allelic pairs.—R.M.

See also absts. 268 (Str. dysgalactiae infection); 272-273 (B.C.G.); 275-278 (tuberculin reaction); 282 (antigenic structure of M. tuberculosis); 284 (allergy in swine erysipelas); 288 (Pasteurella infection in buffaloes); 300 (contamination of fowl pox vaccine by S. pullorum); 305 (immunization of cows against brucellosis with Huddleson's mucoid vaccine); 306-307 (brucellosis); 315 (fowl spirochaetosis); 318 (tetanus); 349 (Tr. foetus antibodies in young calves); 351 (effect of splenectomy on immunity against experimental Plasmodium infection in rats); 355-363 (F. & M. disease); 368 (rabies); 370 (preparation of pigeon and fowl pox vaccine); 371 (fowl pox); 373 (antibody formation and nutrition); 374 (antigenic relationship of arthropod-borne viruses); 378 (a complement fixation test for the diagnosis of E.I.A.); 382-383 (rinderpest); 384 (Rift Valley fever antibodies in monkeys); 385 (enzootic abortion in ewes); 395-400 (Newcastle disease); 427 (allergic reaction in horses to Boophilus microplus larvae); 438 (Trichinella); 550 (report, Nyasaland Protectorate); 551 (report, Belgium); 552 (book, B.C.G.).

PARASITES IN RELATION TO DISEASE [GENERAL]

HABERMANN, R. T., WILLIAMS, F. P. & THORP, W. T. S. (1954). **Common infections and disease conditions observed in wild Norway rats kept under simulated natural conditions.** — *Amer. J. vet. Res.* **15**, 152-156. [Authors' summary and conclusions modified.] **418**

Wild brown rats from an island in Chesapeake Bay which had been kept under simulated natural conditions in Maryland for 27 months were found to be infested with parasites that commonly occur in wild rats in the Washington, D.C. area. The most common para-

sites of wild rats in this study were *Capillaria hepatica*, *Heterakis spumosa*, *Hymenolepis* spp., and *Eimeria* spp. Other parasites found were *Strongyloides ratti*, *Trichosomoides crassicauda*, *Cysticercus fasciolaris*, *Syphacia obvelata*, and *Trichuris muris*. The important diseases of wild rats in this study were bronchiectasis and abscesses of the lung, middle-ear infections and *Bartonella muris* infection. No species of *Salmonella* were isolated from the faeces of 100 wild rats.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HÄRDTL, H. (1952/53). Tetrahydronaphthalin als Giftstoff gegen tierische Läuse. [**Tetrahydronaphthaline in the control of lice.**]—*Arch. exp. VetMed.* **6**, 479-486. **419**

Tetrahydronaphthaline, a fat and wax solvent, exerts its action on lice either by a direct wetting action or by the residue after evaporation. Lice from domestic animals were killed by exposure to the drug in concentrations of 2-5% for 30-60 sec.—E. J. L. SOULSBY.

GRAHAM, N. P. H. (1954). **Observations on the use of dieldrin for the control of body strike in Merino weaners.**—*Aust. vet. J.* **30**, 121-124. **420**

Jetting along the mid-line of the back with 0.1% dieldrin (a chlorinated naphthalene derivative) emulsion gave a very good protection to sheep for 14 weeks. A 0.05% solution which gave very good protection for 5 weeks, was still effective after 14 weeks, and after 10-13 weeks was estimated to be just as effective as 0.05% γ -isomer benzene hexachloride (B.H.C.) emulsion after 5-7 weeks. Up to 6 to 8 weeks 0.1% aldrin (a chlorinated naphthalene derivative) appeared just as effective as 0.1% dieldrin. A number of body strikes were cured by jetting the struck area with 0.1% dieldrin, 0.1% aldrin or 0.05% γ -isomer of B.H.C.—M. D. MURRAY.

QUAEDVLIEG, E. J. A. A. (1953). La lutte contre l'hypodermose des bovidés, ou varron, aux Pays-Bas. [**Control of warbles in the Netherlands.**]—*Proc. XVth Int. vet. Congr., Stockholm.* 1953. **1**, Pt. 1. 444-450. [In French. English and German summaries.] **421**

An account of the life-histories of *Hypoderma bovis* and *H. lineatum* and of the good results obtained in Holland since the second world war by a campaign arousing interest among farmers, and tightening the veterinary supervision to ensure that stock owners obeyed the regulations obliging them to treat all patently infested cattle by the first of June.—A.S.

NEEL, W. W. (1954). **Control of human bot fly on cattle.**—*J. econ. Ent.* **47**, 540-541. **422**

There was no significant difference in the reduction of the number of larvae of *Dermatobia hominis*, counted on the backs of cattle, after treatment with 0.5% toxaphene (a chlorinated terpene), 0.15% aldrin (a chlorinated naphthalene derivative), or a combination of 0.5% D.D.T. with 0.03% of the γ -isomer of

benzene hexachloride. There were, however, more larvae on the untreated than the treated animals. Six pints of insecticidal wash were applied per beast, at intervals of 14 days, using a power sprayer.—D. W. JOLLY.

BUXTORF, A. (1952). Die Verwendung von Insektiziden zur Bekämpfung von Glossinen. [**Use of insecticides in the control of Glossina.**]—*Acta trop., Basle.* **9**, 217-232. [In German. French summary.] **423**

A general account, with references to the literature.—R.M.

OPPENORTH, F. J. (1954). **Metabolism of gamma-benzene hexachloride in susceptible and resistant houseflies.** [Correspondence.]—*Nature, Lond.* **173**, 1000-1001. **424**

Significantly less of the γ -isomer of benzene hexachloride (γ -B.H.C.) was recovered from resistant houseflies than from susceptible houseflies after injection of 0.3 mg. into the thorax in both strains. As no excretion of the γ -B.H.C. was detected, the author assumed that the lost insecticide had been metabolized. Some loss of γ -B.H.C. was observed in susceptible flies before they died as a result of intoxication.—D. W. JOLLY.

SINCLAIR, K. B. (1954). **The incidence and life cycle of *Linguatula serrata* (Frolich 1789) in Great Britain.**—*J. comp. Path.* **64**, 371-383. [Author's conclusions modified.] **425**

A survey of the incidence of live nymphs of *L. serrata* in mesenteric lymph nodes of animals slaughtered at a Cheshire abattoir revealed that 30.1% of 681 cattle and 0.42% of 476 sheep were infested; 269 calves (under one month) and 116 pigs were free from infestation. In a survey which included adult cattle only, an area variation was shown in the incidence of infestation, viz: 72.4% in 362 animals from N. Ireland, 50.7% in 381 from E. Scotland and 30.9% in 758 from N.W. England and N. Wales.

No *L. serrata* adults were found in the nose of 206 dogs examined from the Liverpool area.

Live nymphs were administered *per os* and by stomach tube to experimental dogs and observations were made on the migration of the parasite from the stomach to the nasal cavities. It was found that the migration of the nymphs is assisted by the coughing and/or vomiting set up in the host by the local irritation resulting from their presence.

TURNER, N. (1953). **Methylenedioxyphenyl synergists for insecticides.** — *Bull. Conn. agric. Exp. Sta.* No. 570, pp. 23. 426

T. discussed the nature of synergism and described an experiment in which he tested several methylenedioxyphenyl compounds for their possible synergistic effects with pyrethrum, rotenone, and allethrin, when injected together with these substances into milkweed bugs (*Oncopeltus fasciatus*).—A.S.

RIEK, R. F. (1954). **Allergic reaction in the horse to infestation with larvae of *Boophilus microplus* (Canes). (Ixodides: Acarina.)** — *Aust. vet. J.* 30, 142-144. [Abst. from author's summary.] 427

Allergic skin reactions in the horse to infestation with the larvae of *B. microplus* are seen most frequently in the late summer in Queensland and are confined largely to the legs and muzzle, but may also appear as discrete papules on the body. As a preventive R. recommended regular spraying with 1% pp' D.D.T. He suggested that affected horses might respond to histamine azoprotein ("hapamine") which has been found to be effective in allergic dermatitis [*V.B.* 24, 478].

HOOGSTRAAL, H. (1954). **A preliminary, annotated list of ticks (Ixodoidea) of the Anglo-Egyptian Sudan.**—*J. Parasit.* 40, 304-310. [Author's summary modified.] 428

H. gave an annotated list of 60 species (plus probably three additional subspecies) of ticks now known to occur in the Anglo-Egyptian Sudan. He used the following new name combinations; *Boophilus annulatus* (? *congolensis*), *Haemaphysalis houi*, and *Rhipicephalus longus*. He considered *Amblyomma werneri werneri* to be a synonym of *A. nuttalli*. He suggested that the original description of the female *H. calcarata* referred in fact to *H. houi*.

BROWNING, T. O. (1954). **Water balance in the tick *Ornithodoros moubata* Murray, with particular reference to the influence of carbon dioxide on the uptake and loss of water.**—

J. exp. Biol. 31, 331-340. [Abst. from author's summary.] 429

Unfed nymphs of *O. moubata* are able to absorb water from moist air (95% relative humidity) and to restrict their rate of water loss in dry air. This ability is lost (a) in atmospheres containing 30-45% CO₂; (b) in atmospheres containing more than 90% N₂; (c) immediately after the tick is fed; (d) gradually after the tick has been starved for some 5 months. The effect of high (30-45%) concentrations of CO₂ is mainly upon the activity of the epidermal cells, possibly mediated through the c.n.s. The conc. required to cause opening of the spiracles is only about 5%.

INNES, J. R. M., COLTON, M. W., YEVICH, P. P. & SMITH, C. L. (1954). **Lung mites. Pulmonary acariasis as an enzootic disease caused by *Pneumonyssus simicola* in imported monkeys.**—*Amer. J. Path.* 30, 813-835. [Authors' summary modified.] 430

In over 400 P.M. examinations in Maryland, U.S.A. of imported old-world rhesus monkeys, lung mites (*Pneumonyssus* spp.) and their lesions were an almost universal finding. The disease is enzootic in such imported animals, and it might be a complicating factor which could influence interpretation of experimental work, especially that involving the lung. The disease cannot be diagnosed clinically nor roentgenologically, nor is there any constant associated eosinophilia of the peripheral blood. The lesions form scattered discrete foci in the lungs, varying in severity and dissemination in individual monkeys. The process is characterized by the production of a localized bronchiolitis and peribronchiolitis, or focal pneumonitis in which eosinophiles may be prominent. The focus rarely becomes lobar, but there may be some degree of bronchiolectasis. Pigments and doubly refractive crystals are constantly present in, near, and distant from lesions or from mites. At least a part of the pigment and crystals is derived from mites sucking blood from the host, and excreting breakdown products of haemoglobin. Little is known regarding the pathogenesis of the condition.

See also absts. 374-375 (arthropod borne viruses); 494 (insect vectors of paspalum ergot); 550 (report, Nyasaland Protectorate); 551 (report, Belgium).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

JOHN, B. (1953). **The behaviour of the nucleus during spermatogenesis in *Fasciola hepatica*.** — *Quart. J. micr. Sci.* 94, 41-56. 431

J. described the histology of the testes of *F. hepatica* and cytological changes in the

nuclei of the male cells during spermatogenesis. —R.M.

HOFSTRA, K. (1954). **Over de verspreiding der cysticercose van het rund in Nederland.**

[Incidence of *Cysticercus bovis* in the Netherlands.] — *Tijdschr. Diergeneesk.* **79**, 417-428. [English, French and German summaries.] 432

Of 38,223 Dutch cattle slaughtered at the public abattoir in the Hague in 1946-47, 8.6 per thousand harboured living cysticerci, as compared with 2,854 Danish cattle with 6.6 per thousand and 4,492 Irish cattle with 27.2 per thousand, inspected under the same conditions at the same abattoir. The majority of the Dutch cases came from the Rhine delta. H. emphasized the need for control on an international basis.—C. A. VAN DORSSEN.

BIOCCA, E. & MASSI, O. (1952). Il problema della echinococcosi in Italia: indagini e considerazioni. [The *Echinococcus* problem in Italy.—*Riv. Parassit.* **13**, 235-240. 433

In and around Rome, 56% of sheep (841 examined), 15% of cattle (1,088 examined), 0.8% of horses (1,100 examined) and 4% of dogs (100 examined) were infested with *Echinococcus*. No *Echinococcus* was found in 38 cats, 10 foxes and 10 badgers. Scolices were present in a high proportion of the cysts found in sheep and horses, and in a low proportion of those in cattle.—R.M.

HANSEN, M. F., TODD, A. C., KELLEY, G. W. & CAWEIN, M. (1950). Effects of a pure infection of the tapeworm *Moniezia expansa* on lambs.—*Bull. Ky agric. Exp. Sta.* No. 556. pp. 11. 434

The authors studied the effects of *M. expansa* infestation in 6 worm-free lambs fed from 5-120 cysticercoids. Retardation of weight gain began as the tapeworms matured, and was particularly pronounced at the time, usually about 60 days later, when they were spontaneously expelled.

There was a marked decrease in the haemoglobin content of the blood, but the w.b.c. count remained unchanged. The lambs were resistant to re-infestation for some time after their recovery from the original infestation.—D. POYNTER.

SUPPERER, R. (1954). Versuche über die Entwicklung des Geflügel-Bandwurmes *Hymenolepis cantaniana* (Polonio 1860). [Life cycle of the poultry tapeworm *H. cantaniana*.]—*Wien. tierärztl. Mschr.* **41**, 199-202. [English, French and Italian summaries.] 435

S. described the life cycle of *H. cantaniana*, the intermediate hosts of which in Austria are the beetles, *Onthophagus ovatus* and *O. ruficapillus*. He suggested a method of controlling

these beetles, using fresh cattle faeces placed in a corner as a bait, inaccessible to the fowls, and disposed of suitably at regular intervals, the beetles thus being eliminated.—F.E.W.

BURCH, G. R. (1954). A new oral anthelmintic for canine whipworms.—*Vet. Med.* **49**, 291-293. 436

B. examined the anthelmintic action of 3-methyl-1-pentyn-3-yl sodium phthalate in dogs with *Trichuris vulpis* infestation. Fifty dogs were dosed after fasting (Group A), 50 were kept on their normal ration and dosed after a light meal (Group B), and there were 50 controls. Of the treated dogs which did not vomit the anthelmintic, 40 out of 42 in Group A, and 44 out of 47 in Group B, were found at P.M. examination, 5-7 days after dosage, to be completely free from the worms, or, in a few cases, to have a small residual infestation (6 worms). The controls were found to have an average of 44 worms.—A.S.

CHAN, K. F. & BROWN, H. W. (1954). Treatment of experimental trichinosis in mice with piperazine hydrochloride.—*Amer. J. trop. Med. Hyg.* **3**, 746-749. 437

Daily doses of 1.5 g./kg. of piperazine hydrochloride for 7 days were 87 and 92% effective against the adult forms of *Trichinella spiralis* in the intestines of mice that had been dosed with 700 larvae 6 and 9 days respectively before treatment was begun. Mice tolerated the drug well at this dosage. The LD₅₀ oral dose was found to be approx. 7.6 g./kg. The authors suggested that piperazine citrate might be used in therapeutic tests in human trichinosis and gave indications as to suitable dosage.—F.E.W.

GAASE, A. (1954). Erfahrungen mit der Sero-Diagnostik der Trichinose in Deutschland. [Serological diagnosis of *Trichinella* infestation in Germany.]—*Z. Hyg. InfektKr.* **139**, 38-42. 438

A general account of the use of the precipitin test and the complement-fixation test in the diagnosis of *Trichinella* infestation in human beings in Germany. [See also V.B. **22**, 464.]—R.M.

IKOMA, H. & ITO, S. (1952). [Studies on the prevention of swine kidney worms (*Stephanurus dentatus*).]—*Bull. nat. Inst. agric. Sci., Japan.* Ser. G. No. 3. pp. 183-202. [In Japanese. Abst. from English summary.] 439

The authors investigated the morphology of *S. dentatus*, the resistance of eggs and larvae, and pathological findings in, and excretion of

eggs in the urine by, infected pigs. The earliest age of pigs at which eggs were present in the urine was 140 days. More eggs were present in urine collected in the evening than in the morning. Eggs hatched in 46 hours at 20°C. and in 22 hours at 30°C. Eggs and larvae were killed by exposure to water at 50°C. for 15 min., at 0°C. for 11–19 hours, and to direct sunshine for 3 hours. Control measures consisted in keeping piglets away from the sow, except during feeding times, and the cleaning of, and provision of dryness in, the pens.—R.M.

GIBSON, T. E. (1954). *Studies on Trichostrongylus axei*. II. The pathogenesis of *T. axei* in sheep maintained on a high plane of nutrition.—*J. comp. Path.* 64, 360–370. [Author's conclusions modified.] 440

Artificial infestation with *T. axei* of 3 lambs, 2 months old, maintained on a high plane of nutrition, produced severe parasitic gastritis from which two of them died. The surviving lamb suffered a check in weight gain from the time the infestation became established until resistance was developed.

Haematological examination of the three sheep, together with three similar worm-free controls revealed no changes from the normal. G. compared these findings with those of previous studies [*V.B.* 24, 3359] in which lambs infested when on a low plane of nutrition developed a marked anaemia. He postulated that this anaemia may be caused by worms absorbing large amounts of trace elements or vitamins from the gut contents of infested sheep.

It was noticed that although severe abomasitis was present in lambs dying from heavy infestations with *T. axei*, the inflammation had subsided in lambs in which the disease was of long standing, the striking abomasal lesion in these sheep being "ringworm-like ulcers" scattered widely over the mucous membrane.

EMDIN, R. & BELLI, G. (1953). La formula leucocitaria di cavia sperimentalmente infestata con larve di *Metastrongylus elongatus*. [The white cell count in g. pigs experimentally infested with *Metastrongylus elongatus*.] —*Ann. Fac. Med. vet. Pisa.* 6, 87–94. [English and French summaries.] 441

The authors observed an increase in eosinophile leucocytes in the blood of g. pigs infested with *M. elongatus*. There was no basophilia as described by Porter [*V.B.* 9, p. 322] in *M. elongatus* infestation of g. pigs.—R.M.

AKMAN, S. (1952). Tek tirnaklı hayvanların bağırsaklarında yaşayan askaritlere karşı en

müessir ilâcın araştırılması. [Studies on anthelmintics for ascaris infestation in equines.] —*Thesis, Ankara.* pp. 131. [Abst. from German summary.] 442

The author reported results of the treatment of ascaris infestation in 126 equine animals, using various preparations, including carbon disulphide, oil of chenopodium, carbon tetrachloride, arsenical solution, and santonin. —A.S.

HERLICH, H. & PORTER, D. A. (1954.) Experimental attempts to infect calves with *Neoascaris vitulorum*.—*Proc. helm. Soc. Wash.* 21, 75–77. 443

The authors failed to set up *A. vitulorum* infestation in 8 calves by dosing them with infective eggs and in 2 other calves by dosing them with larvae from experimentally infested mice. Calves born to 5 cows that had been dosed with infective eggs of *A. vitulorum* during the latter third of 7 gestation periods, and to another cow so dosed from the time of impregnation up to parturition, failed to acquire the infestation. One of twin calves born to a cow that had been dosed with infective eggs from 3 weeks before service and throughout pregnancy was found to be passing eggs of *A. vitulorum* 23 days after birth and passed a sexually mature female of this species 4 days later.—F.E.W.

CASAROSA, L. (1953). Sulla infestione sperimentale della cavia con uova embrionate di *Neoascaris vitulorum*. (Nota definitiva.) [Experimental infestation of g. pigs with *Ascaris vitulorum*.] —*Ann. Fac. Med. vet. Pisa.* 6, 60–76. [English and French summaries.] 444

C. gave 1–4 doses, each consisting of 200–500 embryonated eggs of *A. vitulorum*, to 20 g. pigs, which were killed 8–10 days after the last dose. He found "green spotted" lesions in the lungs, liver and kidneys, which were similar to those he observed in *A. vitulorum* infestation in calves [see *V.B.* 24, 3204].—R.M.

I. GUTHRIE, J. E. (1954). Critical tests with cadmium anthranilate as an ascaricide in swine.—*Vet. Med.* 49, 413–418. 445

II. GUTHRIE, J. E. (1954). Further observations on the efficacy of cadmium anthranilate as an ascaricide in swine.—*Ibid.* 500. 446

I. Cadmium anthranilate, administered mixed with ordinary food at a concentration of 0.066% for 3–4 consecutive days, was very efficient as an anthelmintic in *Ascaris lumbricoides* infestation in pigs. Twenty-six infested pigs so treated passed a total of 531 ascarids in

the faeces and, at P.M. examination shortly afterwards, G. found a total of 24 in the small intestine, representing an anthelmintic efficiency of 94%. Feeding pigs with a concentration of the drug in the food of 0.66% for 4 days, or 0.066% continuously for 11 weeks, appeared to have no harmful effect on the pigs, other than reduction of weight gain and food consumption.

Cadmium was found in minute quantities in the kidney, liver, and sometimes the lungs and spleen, of treated pigs, but never in the muscles; 30 days after treatment had ceased the amount of Cd in the body tissues was insignificant. The consumption by dogs, rats, and human beings of the flesh of pigs that had been treated two weeks previously with cadmium anthranilate had no harmful effect, even when treatment had consisted of the administration of the drug for 45 days.

II. G. found that the effective concentration of cadmium anthranilate in the food could be reduced to 0.044%. In 54 pigs infested with *A. lumbricoides* the total number of ascarids passed in the faeces after treatment at this dosage was 857, an average of 16 per pig. At P.M. examination shortly afterwards he found a total of 75 ascarids in the small intestines of these pigs; 94% of the worms had been removed by the anthelmintic.—R.M.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

CASS, R., RILEY, J. F., WEST, G. B., HEAD, K. W. & STROUD, S. W. (1954). **Heparin and histamine in mast-cell tumours from dogs.** [Correspondence.] — *Nature, Lond.* **174**, 318-319. 449

The authors reported that subcutaneous mast-cell tumours from dogs were rich in heparin and histamine. The heparin content was rather variable, and it was especially high in tumours with a high proportion of mast cells containing strongly metachromatic granules.—A.S.

PETERMANN, M. L., HAMILTON, M. G. & REILLY, H. C. (1952). **The basic proteins of *Aspergillus fumigatus* with tumor-inhibiting properties.**—*Arch. Biochem.* **37**, 117-130. 450

The factor present in culture filtrates of *A. fumigatus* which inhibited the growth of Sarcoma 180 in mice [see *V.B.* **21**, 3287] consisted of a highly basic protein or group of proteins, with isoelectric points near pH 10.—R.M.

LYMAN, C. P. & FAWCETT, D. W. (1954). **The effect of hibernation on the growth of sar-**

BISHOP, H. W. (1954). **Diagnosis of heart-worm infection.—*J. R. Army vet. Cps.* **25**, 47-49. 447**

The addition of 5 ml. of 2% acetic acid per ml. to blood samples facilitated observation of the larvae of *Dirofilaria immitis*, the numbers of which, in two dogs, were found to be inversely proportional to the metabolic rate of the host.—D. POYNTER.

BÖHM, L. K. & SUPPERER, R. (1954). Weitere Untersuchungen über Mikrofilarien als Erreger der Periodischen Augenentzündung der Pferde. [**Microfilariae of *Onchocerca* as the cause of equine periodic ophthalmia.**]—*Wien. tierärztl. Mschr.* **41**, 129-139. [English, French and Italian summaries.] 448

Microfilariae of *O. cervicalis* were found in the eyes of 78 out of 102 horses in Austria affected with equine periodic ophthalmia, and in 9 out of 75 horses with the adult stage of *O. cervicalis* in the ligamentum nuchae. In one horse with an acute attack of periodic ophthalmia affecting both eyes, there were lesions of the cornea and sclera, and exudative iritis, cyclitis and chorioiditis, and microfilariae were present in abundance in the cornea, sclera and uvea of both eyes.—H. BEHRENS.

coma in the hamster.—*Cancer Res.* **14**, 25-28. 451

Growth of a homologous methylcholanthrene-induced sarcoma, implanted beneath the epithelial lining of the cheek pouch of the hamster (*Mesocricetus auratus*) was to some extent retarded by the slightly subnormal cheek pouch temperature of hamsters awake in the cold, and was almost entirely suppressed at the low body temp. of the hibernating state. Early onset of hibernation appeared to prevent vascularization of a tumour implanted in the cheek pouch, while slower onset arrested or greatly retarded the growth of a tumour which had already established a blood supply. When the animals returned to a homiothermal state in a warm environment, the implanted tumours resumed their growth.—E. COTCHIN.

JACOTOT, H., VALLÉE, A. & VIRAT, B. (1954). Sur la généralisation du fibrome infectieux de Shope. Cas particulier des lapins à fourrure. [Cases of generalization of Shope's

fibroma in Angora rabbits.] — Bull. Acad. vét. Fr. 27, 105-111. 452

One out of 8 rabbits inoculated intratesticularly with Shope's fibroma virus developed 24 cutaneous tumours widely distributed over the body. Material from one of the tumours was given 3 passages in a total of 34 rabbits, but none of them developed metastatic tumours. Two Angora rabbits also developed metastatic

fibromas after vaccination; material from these, passaged in 57 rabbits, likewise failed to produce tumours except at the site of inoculation. The authors tried unsuccessfully to produce metastatic tumours in a number of rabbits by reducing their resistance with cortisone or A.C.T.H., and also by plucking out the fur by hand after inoculation.—A.S.

NUTRITIONAL AND METABOLIC DISORDERS

KERSEY, R. C. & LEGHORN, F. V. (1953). **A microbiological assay of penicillin in animal feeds.**—*Appl. Microbiol.* 1, 150-152. 453

The authors described an assay method which employed a stable penicillin formamide extract of feed samples, and compared it with the method employing methyl alcohol extracts. —R.M.

RUSSELL, L. & MCCLYMONT, G. L. (1953). **Antibiotics for stimulating growth in pigs.**—*Agric. Gaz. N.S.W.* 64, 604-605. 454

A comment on known facts, together with details of confirmatory experiments using aureomycin and penicillin.—D. POYNTER.

ANDERSEN, H. E. (1954). **Changes of the intestinal flora produced by peroral administration of penicillin in normal swine.**—*Nord. VetMed.* 6, 622-642. [In English. German and Danish summaries.] 455

The author observed changes in the intestinal flora of young pigs given penicillin with their rations for 4, 8, 12, 21 or 135 days. Samples were taken from the stomach, jejunum, caecum, colon and rectum, and, after suspension in saline and removal of coarse particles, sown on a range of media so selected that each possible member of the flora would be able to grow on at least one medium. Penicillin produced great increases in the numbers of coliform bacteria, which were observed to move forward in the alimentary tract and settle in the anterior part of the small intestine and, occasionally, the stomach. Lactobacilli decreased greatly in numbers, and streptococci were almost exterminated. Staphylococci were unaffected.—A.S.

PAPADANIEL, S. (1954). **[Paralytic haemoglobinuria and pulmonary oedema in calves, following ingestion of a large quantity of water.]**—*Delt. Hellen. kten. Hetair.* 2, 619-623. [In Greek. Abst. from French summary.] 456

P. discussed a condition seen in calves after they have drunk excessive quantities of water.

The lowering of osmotic pressure of the blood leads to haemolysis and haemoglobinuria, while the increase in blood volume leads to hypertension of the arteries, associated with cardiac insufficiency and pulmonary oedema. The condition is not serious.—A.S.

HONEKER. (1954). **Die Ziegemilchanämie in neuzeitlicher Belichtung. [Recent work on anaemia in children fed on goats' milk.]**—*Prakt. Tierarzt.* No. 3. pp. 59-61. 457

A general note on anaemia in young children fed goat's milk, with a discussion on whether the anaemia is caused by a toxic factor or by vitamin deficiency in the milk. The condition is cured by giving liver extract or vitamin B₁₂.—A.S.

ENGLERT, H. K., BAUER, H. & KUMMER, H. (1953). **Über die Fischmehlkrankheit des Schweines. ["Fish-meal disease" in pigs.]**—*Arch. Tierernährung. Tierz.* 3, 195-222. 458

Pigs which were fed a diet containing 5-8% codfish meal developed a variety of symptoms including intestinal catarrh, glomerulonephritis, thickening of the tongue epithelium, and eczema developing into hyperkeratosis. The fish meal was incriminated after an experiment in which 4 pigs, fed the meal [in unstated quantity], developed the symptoms described, while 4 controls were unaffected. When the same fish-meal, after 9 months' storage, was tested in another similar experiment, the pigs only developed pruritus. The authors were unable to isolate a toxic substance from the meal, but suspected contamination by bacteria, or by some substance such as trichlorethylene, used in processing.—A.S.

HANNING, G. (1954). **Der Einfluss verschiedener Futterzusammensetzungen auf die Gewichtszunahme, den Blutzucker und die Eiweisskörper im Blutserum der Schweine. [Influence of different diets on the sugar content of the blood and the protein content of**

the serum of pigs.]—*Dtsch. tierärztl. Wschr.* 61, 253-255. 459

H. examined the blood sugar and serum protein levels of groups of pigs receiving various diets (normal, with a high potato content; oats with low potato; barley with low potato; maize with low potato; and a group receiving potatoes alone). The blood sugars rose as the amount of carbohydrate in the diet increased. The serum albumin fraction was dependent on the amount of protein in the diet: the globulin fraction was unaffected. A high protein diet was necessary for good weight gains.—A.S.

GÜNTHER, F. (1954). Koronarerkrankungen mit Berücksichtigung des Cholesterinstoffwechsels. [Diseases of the coronary arteries with reference to cholesterol metabolism.]—*Prakt. Tierarzt.* No. 9. pp. 216-218. 460

A note on diseases of the coronary arteries in human beings. After discussing the role of cholesterol in metabolism G. upheld the belief that a diet over-rich in cholesterol is an important cause of arteriosclerosis.—A.S.

MERTZ, E. T., BEESON, W. M. & JACKSON, H. D. (1952). Classification of essential amino acids for the weanling pig. — *Arch. Biochem.* 38, 121-128. 461

The amino acids essential for the good growth of pigs were as follows:— arginine, histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophane and valine.—R.M.

BRUNARD, M. & NAVARRO, J. (1954). Action sur la motricité des estomacs du mouton de quelques esters stables de la choline. I. Choline et carbaminoylcholine. II. Dérivés méthylés de la choline. [Action of some choline derivatives on the motility of the stomachs of the sheep.]—*Bull. Acad. vét. Fr.* 27, 213-217 & 219-225. Discussion: pp. 225-226. 462

The authors investigated the effects of choline, carbaminoylcholine, acetyl- β -methylcholine and carbaminoyl- β -methylcholine at various dosages. All four substances had a hypertonic action on the rumen and abomasum, but not the reticulum, and they all, in small doses, sensitized the stomach muscles to the stimuli of the vagus nerve: at higher dosage, however, all except acetyl- β -methylcholine produced blockage at the nerve endings.

Only carbaminoylcholine stimulated the motor centre of the stomachs.—A.S.

CONVERSE, H. T. (1954). Calcium requirements of dairy cattle.—*Tech. Bull. U.S. Dep. Agric.* No. 1092. pp. 25. 463

C. described four long-term feeding experiments with diets containing constant amounts of calcium. Rations containing 0.16 or more parts calcium per 100 parts dry matter were satisfactory for growth and lactation in cattle. A ration containing 0.12-0.14 parts Ca per 100 parts dry matter was sufficient for the growth of heifers, but did not fulfil the requirements of pregnancy.—R.M.

I. OSBORNE, A. D., FEATHERSTONE, J. & HERDAN, G. (1954). Cobalt deficiency in Herefordshire and Worcestershire. I. Field observations.—*Vet. Rec.* 66, 409-413. 464

II. TRIBE, D. E. & OSBORNE, A. D. (1954). Cobalt deficiency in Herefordshire and Worcestershire. II. Laboratory investigations.—*Ibid.* 413-414. [Authors' summaries modified.] 465

I. Cobalt deficiency affected the growth of lambs on a small number of farms scattered over a wide area of North Herefordshire and North-West Worcestershire. The severity of the condition was less than that seen in South-West England and many other areas and, whilst there may be seasonal variations, it was impossible to confirm the condition on some farms with a marginal or low Co content of the soil.

Controlled experiments on the effect of cobalt added to the diet of lambs were carried out in successive years. Using weight gain as a criterion of the effect of additional Co, there appeared to be a different susceptibility of animals according to sex, the difference in wt. gain of males on the same farm being more pronounced and reaching in general the level of statistical significance, whereas that for females was only significant in an exceptional case. The authors' observations confirmed the view that 0.25 p.p.m. should be regarded as the critical level for the Co content of soil.

II. The authors confirmed that 4 lambs from Worcestershire were suffering from a borderline cobalt deficiency. This was cured either by intramuscular injections of 100 μ g. vitamin B₁₂, or by the oral administration of 7 mg. cobalt sulphate three times weekly.

MITTLER, S. (1954). Nutritional availability of cobaltic oxide, Co₂O₃. [Correspondence.]—*Nature, Lond.* 174, 88-89. 466

By administering by mouth cobaltic oxide prepared from radioactive Co⁶⁰, M. demonstrated that 20% was absorbed from the diges-

tive tract. Most of the Co thus absorbed was found in the liver. Cobaltic oxide could therefore replace the more expensive cobalt chloride, sulphate, or carbonate, which are at present used in mineral supplements for livestock.

—R.M.

VAN KOETVELD, E. E. (1954). Enkele aspecten van de koperstofwisseling. [**Some aspects of copper metabolism.**]—*Tijdschr. Diergeneesk.* 79, 495-504. [English, French and German summaries.] 467

Under normal conditions the copper content of the left lobes of the liver is lower than that of the right part. Since in ruminants it is anatomically impossible to puncture the left lobes of the liver for Cu analysis, the author suggested that determination of the Cu content of the hair should provide a good indication of the state of Cu metabolism in the animal.

—C. A. VAN DORSSEN.

PAMUKÇU, A. M. (1953). Reşitizma ile alkali fosfatase anizimi arasında ilginin deneyisel olarak araştırılması. [**Correlation between alkaline phosphatase activity and rickets in the bones of g. pigs on a vitamin D deficient diet.**]—*Thesis, Ankara*, pp. 118. [English summary.] 468

P. induced rickets in rats by feeding them a diet high in calcium but containing no vitamin D. He examined a tibia, a metacarpal and a costochondral junction histochemically by the method described by Gomori, and found that the local concentration of phosphatase activity in the bones was in direct proportion with the severity of the rachitic changes.—A.S.

MILLEN, J. W., WOOLLAM, D. H. M. & LAMMING, G. E. (1954). **Congenital hydrocephalus due to experimental hypovitaminosis A.**—*Lancet*, 267, 679-683. [Authors' summary modified.] 469

The authors investigated congenital hydrocephalus in late foetal and stillborn offspring of female rabbits subjected to prolonged vitamin-A deficiency before mating and during pregnancy. The primary cause of this hydrocephalus, although not yet determined, may be an overproduction of c.s.f., combined with a relative insufficiency of the cerebral aqueduct.

They discussed the production of congenital abnormalities by vitamin dietary deficiencies and current views on the aetiology of hydrocephalus. The results of their experiments confirmed earlier observations of hydrocephalus in young rabbits from does deficient in vitamin A and showed that it is possible for the hydro-

cephalus to be already established at birth. This finding raises many questions about both the aetiology of congenital forms of hydrocephalus in man and the factors influencing the development of abnormalities in general.

SRÉTER, F. (1954). Karotinterheléses kísérletek szarvasmarhákka. (Előzetes közlemény.) [**Effect of high doses of carotene on cattle.**]—*Mag. állator. Lapja*, 9, 234. [English and Russian summaries. Abst. from English summary.] 470

P. fed 16 kg. carrots to each of 27 cows in 2 herds daily throughout the winter feeding period. The carotene content of the blood increased but the vitamin A content did not change. The calcium blood level in cows of one of the herds increased from an average of 8.5 mg.% to 10.5 mg.%; no change in Ca was observed in the other herd.—R.M.

SINGSSEN, E. P., MATTERSON, L. D., BUNNELL, R. H., KOZEFF, A. & JUNGHER, E. L. (1954). **Experiments with chick encephalomalacia.**—*Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 251-255. [English and French summaries: pp. 50-51 of Summaries of Section Papers.] [Authors' summary modified.] 471

Six pens of breeding hens were maintained on a low fat, semi-purified, vitamin E-deficient diet for a period of 2 months. The ration was also deficient in several other vitamins. Dietary variables were alpha tocopherol, an oily preparation containing vitamins A and D, and a vitamin mixture containing calcium pantothenate, pyridoxine, p-aminobenzoic acid, inositol, biotin, thiamin, folic acid, choline, ascorbic acid, and vitamin K. These variables did not appear to influence either egg production or mortality in adult fowls.

Encephalomalacia, diagnosed by histological examination, was present in 21-day-old embryos and in day-old chicks from these hens. Normal and vitamin E-deficient chicks were fed a diet low in vitamin E, consisting of white maize meal, soya bean oil meal, fish meal, casein, pure vitamins, and minerals. Mortality in both groups of chicks was low, and body wt. averaged 358 g. at 4 weeks of age. A high incidence of encephalomalacia, with 59% mortality, was produced when 2% of the oily preparation containing vitamins A and D was added to the diet. Remarkable protection against encephalomalacia was obtained if diphenylpara-phenylene-diamine was added

to the food at a concentration of 0.05–0.1%. The fact that this substance is not absorbed from the intestine indicated that the causative agent of encephalomalacia arose either in the food or in the intestinal tract, in the absence of antioxidant, and that the adsorption of the antioxidant into the tissues was unnecessary for protection of the chick.

BERNIER, P. E. & COONEY, W. T. (1954). **Black down colour and riboflavin deficiency in embryos of the domestic fowl.**—*Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 66–71. [English and French summaries: pp. 13–14 of Summaries of Section Papers.] [Authors' summary modified.] 472

Black and White Cornish, White Rock and Black Australorp hens were fed a ration deficient in riboflavin (88 mg. riboflavin per 100 lb.). Alternate eggs were injected with 220 µg. of riboflavin. The treated eggs showed a significantly higher percentage of hatchability than the untreated eggs, but the incidence of symptoms of riboflavin deficiency was not significantly different in the hatched chicks and it reached borderline significance in the dead embryos. Black embryos showed a significantly lower percentage of hatchability than embryos of other colours in both treated and untreated eggs. Both black dead embryos and chicks showed a significantly higher incidence of symptoms of riboflavin deficiency than those of other colours. Black Australorp and White Rock hens produced eggs which hatched better and the dead embryos and the chicks showed less extensive black pigmentation than those from the Black and White Cornish hens. The requirements for riboflavin are increased by the process of melanin formation and genes which decrease the intensity or distribution of melanin pigmentation also decrease riboflavin requirements for normal embryonic development. Support for this hypothesis is to be found in several developmental phenomena particularly in the aberrant sex ratios reported for some breed crosses.

SIMONNET, H. & LE BARS, H. (1953.) **La régulation hormonale du métabolisme.** [**Hormonal control of metabolism.**]—*Proc. XVth Int. vet. Congr., Stockholm*. 1953. Part II. pp. 72–95. [In French.] 473

The authors described the hormonal control of metabolism in domestic animals, with special reference to glucose, fats, proteins, water electrolytes, phosphorus, and calcium. They

also described the action of the growth hormone of the anterior pituitary gland, insulin, glucocorticoids, thyroxine, and adrenaline. The paper is illustrated by 14 diagrams showing metabolic inter-relationships, and 5 graphs.

—R.M.

LATVALAHTI, J. (1953). **Experimental studies on the influence of certain hormones on the development of amyloidosis.**—*Acta endocr., Copenhagen*. Suppl. No. 16. pp. 89. [In English.] 474

L. injected into mice 0.5 ml. 5% emulsion of sodium caseinate daily for 28 days. About 40% of mice so treated developed amyloidosis. The incidence of amyloidosis was much higher in mice which had received, in addition to the sodium caseinate, A.C.T.H. or cortisone, and in castrated or thyroidectomized mice. Serum albumin decreased during the deposition of amyloid, and the globulins, particularly α -globulin, increased. Once amyloidosis was established, the γ -globulin level decreased. L. suggested that amyloid was deposited from the blood as the result of prolonged antigen-antibody reactions. Castration may have led to a higher incidence of the disease indirectly, by increasing the activity of the adrenal cortex.

—R.M.

MACLAGAN, N. F. & SPROTT, W. E. (1954). **The *in-vitro* deiodination of thyroxine and triiodothyronine.**—*Lancet*. 267, 368–369. 475

Although the deiodination of thyroxine has been observed *in vivo*, it has not been previously studied *in vitro*. The authors demonstrated the production of iodide from thyroxine and triiodothyronine in homogenates of a number of tissues from rats, employing both radioactive and non-radioactive substances. The anti-thyroxine substance N-butyl 4-hydroxy-3:5-diiodobenzoate inhibited the deiodination of thyroxine and promoted the conversion of thyroxine to triiodothyronine.—R.M.

CARDASSIS, J. (1954). **A propos de 42 cas d'acétose des vaches laitières.** [**Forty-two cases of ketosis in milch cows.**]—*Rec. Méd. vét.* 130, 356–366. 476

An account of ketosis in 42 out of 102 Danish cattle after a 19 days' sea journey from Denmark to Greece under poor feeding conditions. Of the cases which occurred in the first fortnight after the journey the majority (21 out of 24) died, in spite of treatment with glucose given

i/v and vitamin B₁ given i/m, but 17 out of 18 cases which occurred in the 3rd and 4th weeks recovered when similarly treated. C. commented that high yield cattle are prone to hor-

monal disturbances, and suggested that breeding might be aimed at producing cattle which would be metabolically stable in spite of high yield.—A.S.

See also absts. 292-293 (vitamin B₁₂); 373 (antibody formation and nutrition); 493 (effect of vitamin K on dicoumarol hypoprothrombinaemia in dogs); 556 (liver injury).

DISEASES, GENERAL

STABLEFORTH, A. W. (1953). **Diseases of animals. (Part I.)**—*J. R. agric. Soc.* 114, 142-152. 477

TAYLOR, E. L. (1953). **Diseases of animals. (Part II.) Parasitic diseases.**—*Ibid.* 152-160. 478

I. An account of current work on the following subjects:—John's disease; bovine mastitis; relationship between nutrition and fertility; copper deficiency in cattle and sheep; pregnancy toxæmia in ewes; enzootic abortion in ewes; virus pneumonia of pigs; swine erysipelas; oedema disease of pigs.

II. T. described some recent advances in veterinary parasitology concerning *Haemonchus contortus* infestation in sheep; *Trichostrongylus retortaeformis* in rabbits; grassland management in the control of helminth parasites; modern parasiticides (phenothiazine, D.D.T., benzene hexachloride); treatment of coccidiosis with sulphonamides.—R.M.

WILLEMS, L. (1954). Les maladies infectieuses du veau. [**Infectious diseases of calves, antenatal and postnatal.**—*Ann. Méd. vét.* 98, 199-221. 479

In a general note on diseases affecting calves before and after birth W. touched on brucellosis, *Erysipelothrix* (*Listeria monocytogenes* infection, vibrio infection, septicaemia and diarrhoea attributable to various bacteria, trichomoniasis, F. & M. disease, and vitamin deficiency.—A.S.

MANTOVANI, G. & CERETTO, F. (1953). Osservazioni sulle forme morbose della selvaggina in Piemonte. [**Causes of death amongst wild animals and birds in the Piedmont region of Italy.**—*Atti Soc. ital. Sci. vet., Sanremo*, 1952. 6, pp. 571-575. [French and German summaries.] 480

In the Piedmont region of Italy the authors observed, amongst other conditions, Newcastle disease in pheasants and partridges; streptococcus infection in hares; ringworm in hares; necrotic enteritis of unknown cause in partridges.—R.M.

JENNINGS, A. R. (1954). **Diseases in wild birds.**—*J. comp. Path.* 64, 356-359. 481

Of 112 dead wild birds of 30 species examined in the laboratories of the Public Health Service and of the Ministry of Agriculture and Fisheries in a survey from March 1952-March 1954, virus diseases (pigeon pox, avian leucosis) were considered to have been the cause of death in 31, bacterial diseases (*Pasteurella septica*, *Past. pseudotuberculosis*, *Salmonella gallinarum*, *S. pullorum*, streptococci) in 22, phosphorus or trinitroresol poisoning in 20, and trauma in 14. In 24 the cause of death could not be determined.—F.E.W.

POMMER, A. (1953). Der heutige Stand der Röntgen-Diagnostik und Therapie in der Veterinärmedizin. [**X-ray diagnosis and therapy in animals.**—*Proc. XVth Int. vet. Congr., Stockholm*, 1953. Part I. Vol. 2, pp. 985-991. Discussion: Part II, pp. 380-381. [In German. English and French summaries.] 482

P. described therapeutic and diagnostic work in large and small animals carried out at the X-ray Department of the Vienna Veterinary College.—R.M.

WAMBERG, K. (1953). **A new treatment of spavin in horses.**—*Proc. XVth Int. vet. Congr., Stockholm*, 1953. Part I. Vol. 2, pp. 957-963. Discussion: Part II, pp. 371-376. [In English, French and German summaries.] 483

W. examined the bones of the tarsus of 103 healthy horses. Changes characteristic of spavin (chronic, degenerative, erosive osteoarthritis with ankylosis) were present to a greater or lesser extent in all these horses except one. He described a technique for neurectomy of the peripheral nerves of the tarsus. Forty-two out of 59 horses which were lame as a result of spavin, were cured by this operation. He considered that the results were better than those achieved by combined neurectomy of the tibial and deep peroneal nerves.—R.M.

MICHELETTO, B. (1953). La sclerectomia secondo Lagrange nel trattamento dell'idroftalmia nel cavallo. [**Sclerectomy for the treatment of hydrophthalmos in the horse.**]

—*Atti Soc. ital. Sci. vet., Sanremo*, 1952. 6, pp. 355-360. [English and French summaries.] 484

Primary hydrophthalmos of one eye of a horse aged 6 years was cured by partial sclerectomy.—R.M.

JORDANO, D. & GÓMEZ CÁRDENAS, G. (1954). Investigaciones sobre la caída de los toros de lidia. [**Paresis of bulls during bullfighting.**] —*Arch. Zootec., Córdoba*. 3, pp. 3-52. [English summary.] 485

The authors described a syndrome sometimes seen in fighting bulls, usually about 5 min. after they have entered the ring, and when they have had time to become thoroughly excited. Frequently, as a preliminary symptom, the bull loses the full co-ordination of its limbs and tends to stumble. Shortly afterwards the hindquarters appear to lose strength and the animal sinks to the ground for a moment, though it usually manages to struggle up again after about 5 sec.; it may collapse several times in this way.

They examined numerous suggestions that have been put forward to account for the condition, among which were myohaemoglobinaemia, nervous inhibition resulting from over-excitement, a tendency to spasms resulting from a vitamin deficiency of some kind, and the possibility of doping or some other fraudulent practice.

In their own investigations the authors had noted, in affected animals, that hyperplasia of the muscular fibres caused obstruction or blockage in certain dorsal branches of the lumbar and spinal branches of the lateral sacral arteries, and they considered that this alone would be capable of causing collapse: the condition could be aggravated by angiospasm brought on by nervous excitement.

Sometimes there were also lesions in some of the spinal ganglia, and in a preliminary exploration of a hind limb the authors detected mild muscular degeneration. These findings were considered to be suggestive of vitamin E deficiency. Consequently they recommended

that vitamin E should be added to the diet, and that anti-spasmodic drugs should be given before bullfights.—A.S.

HANSEN, H.-J. & OLSSON, S.-E. (1953). The indications for disc fenestration in dog (with film).—*Proc. XVth Int. vet. Congr., Stockholm*, 1953. Part I. Vol. 2. pp. 938-943. Discussion: Part II. pp. 367-369. [In English. French and German summaries.] 486

A general account of the authors' work on disc protrusion in the dog and its treatment by fenestration of the disc [see also *V.B.* 21, 3687, 23, 531 & 24, 2036]. The breed incidence and conservative treatment of the disease were discussed.—R.M.

FISHLER, M. C., COLE, L. J., BOND, V. P. & MILNE, W. L. (1954). Therapeutic effect of rat bone marrow injection in rats exposed to lethal whole body X-radiation. — *Amer. J. Physiol.* 177, 236-242. 487

Rats receiving a single i/v inj. of 50-200 mg. homologous bone marrow after exposure to lethal doses of X-rays (675-770 r) showed decreased mortality and enhanced body weight recovery compared with controls. The larger inoculations of bone marrow were required for protection at the higher radiation dose levels, but even 400 mg. was ineffective after exposure to 800 r.—C. A. E. BRIGGS.

KORAY, A. (1952). Veteriner hekimliğinde böbrek fonksiyonunun kontroluna ait usullerden bazıları üzerinde araştırmalar. [**Kidney function tests used in veterinary medicine.**] — *Thesis, Ankara*. pp. 131. [Abst. from German summary.] 488

K. studied the excretion of methylene blue, phlorrhizin, indigo-carmin and potassium iodide in 22 dogs, 40 sheep and 4 horses, to ascertain whether renal dysfunction had any characteristic effect on the excretion of these substances. The animals had previously been examined for renal dysfunction by blood and urine tests. He was unable to state any definite findings as the number of animals used was too small.—A.S.

See also *absts.* 555 (book, mechanism of disease); 557 (index of treatment in small animal practice).

POISONS AND POISONING

RAC, R. & CRISP, C. S. (1954). Lead poisoning in domestic ducks.—*Aust. vet. J.* 30, 145-146. 489

Eight out of 11 young ducklings died following the ingestion of lead flakes, picked up whilst on free range. Analysis of the organs of one duckling revealed the following concentra-

tions (p.p.m.) of lead: caeca 3200, intestine 80, skin 7, liver 60, muscle 4 and skeleton 105. —L. HART.

MACDONALD, N. S., EZMIRLIAN, F., SPAIN, P. & ROUNDS, D. E. (1953). Agents diminishing skeletal accumulation of lead. — *Arch.*

industr. Hyg., Chicago. 7, 217-220. 490

Deposition of lead in the skeleton of rats following i/v administration of lead acetate was diminished if, half an hour after administration of the lead, one of the following substances was injected i/v:— tetrasodium salt of ethylenediaminetetraacetic acid; casein hydrolysate; pectin; a co-polymer of methylvinyl ether and maleic anhydride; glucuronolactone; oxypolygelatin; polyvinylpyrrolidone. These substances may therefore be of use in preventing the accumulation of radio-active elements in the skeleton of animals exposed to them.—R.M.

BELL, W. B. (1954). **The production of hyperkeratosis (x disease) by a single administration of chlorinated naphthalenes.**—*J. Amer. vet. med. Ass.* 124, 289-290. 491

A single oral administration to 3 calves of 5-10 mg./lb. body wt. chlorinated naphthalene either in a 3% mixture with vegetable oil or lubricant produced hyperkeratosis three days later. Two died in 14 and 46 days respectively and the other was slaughtered on the 57th day. P.M. examination revealed typical lesions.

—J. A. NICHOLSON.

MCENTEE, K. & OLAFSON, P. (1953). **Reproductive tract pathology in hyperkeratosis of cattle and sheep.**—*Fertil. & Steril.* 4, 128-136. [Authors' summary modified.] 492

In bulls with hyperkeratosis the authors found squamous metaplasia of the accessory sex glands and excretory ducts of the testicle. In heifers and cows there was metaplasia of the cervix and Gartner's ducts. Metaplasia was not found in rams, but was present in the uterus and cervix of ewes with experimentally-produced hyperkeratosis.

RUTQUIST, L. & BÖRNFORS, S. (1954). **Jämförande undersökningar av olika K-vitaminers inverkan på av dicoumarolpreparat framkallad hypoprotrombinämi hos hund. [The effect of various preparations of vitamin K on hypoprothrombinaemia in dogs caused by dicoumarol.]**—*Nord. VetMed.* 6, 511-519. [In Swedish. English and German summaries. Abst. from English summary.] 493

The authors administered different vitamin K preparations to 10 dogs, which had been given 0.02-0.03 g. "dicasat" (a dicoumarol preparation) per kg. body wt. Quick and distinct effect was obtained with a synthetic vitamin K₁ when given intravenously or by mouth in doses of 50-100 mg., but not when injected intramuscularly. No significant effect was observed with intravenous administration of two other proprietary preparations of vitamin K.

LANGDON, R. F. N. & CHAMP, B. R. (1954). **The insect vectors of *Claviceps paspali* in Queensland.**—*J. Aust. Inst. agric. Sci.* 20, 115-118. [Abst. from authors' summary.] 494

A study of the insect vectors of paspalum ergot revealed that the fly, *Pyrellia caerulea*, which ingests the conidia and voids them with its faeces, plays the most important role in the spread of ergot in southern Queensland.

PLACIDI, L. (1954). **En marge de la maladie de Newcastle. Phénomènes nerveux encéphaliques et médullaires (githagisme) chez les volailles. [Differentiation of nervous symptoms caused by Newcastle disease and those caused by *Lychnis githago* (corn cockle) poisoning in birds.]**—*Rec. Méd. vét.* 130, 500-502. 495

Fowls poisoned by corn containing corn cockle seed present nervous symptoms which may be confused with those of Newcastle disease. When P. fed corn containing corn cockle seed to 2 adult fowls they developed, after a fortnight, paresis of the legs and wings, with convulsive movements of the head, and intermittent sleepiness. Autopsy after 2 months revealed no lesions.—A.S.

MORAN, E. A. (1954). **Cyanogenetic compounds in plants and their significance in animal industry.**—*Amer. J. vet. Res.* 15, 171-176. [Author's summary modified.] 496

A survey of literature. M. discussed plants that may be harmful because of their cyanogen content, the animals that are most likely to be harmed, the conditions and amount necessary to produce illness, the precursors of the hydrocyanic acid in plants, the symptoms produced, possible remedies, and P.M. findings in poisoned animals. He listed 49 references.

JOLLY, D. W. (1954). **Studies in the acute toxicity of dieldrin to sheep.**—*Vet. Rec.* 66, 444-447. [Abst. from author's summary.] 497

D. studied the toxicity of dieldrin (a chlorinated naphthalene derivative) as a sheep dip because of its value in the prevention of blowfly strike. In mice and g. pigs the acute oral L.D.₅₀ was approx. 75 mg./kg. and 25 mg./kg. respectively; in sheep it was 50 to 75 mg./kg.

Approx. 50% of groups of mice and g. pigs died when dipped for 30 sec. in concentrations of 0.10 and 0.25% respectively. Sheep survived a single dipping in concentrations of 0.5 to 1.0% without ill effect.

A total of 32,000 sheep, representing 52

flocks, were immersed in dip washes containing 0.05 to 0.6% dieldrin, without evidence of a toxic reaction.

The symptoms of dieldrin intoxication are nervous in type and manifested by hypersensitivity, convulsions and depression.

It was concluded that no injury to the health of sheep should result following a dipping in 0.05 to 0.10% dieldrin, which is the concentration recommended in the U.K. for the control of fly strike.

ALLMARK, M. G. (1954). **Observations on acute and chronic toxicity studies.** — *Canad. J. publ. Hlth.* **45**, 18-23. 498

The author gave a brief outline of the procedures for acute and chronic toxicity studies. It is essential that acute, sub-acute and chronic toxicity levels be determined. The last should be continued for the lifetime of the animal. All factors relating to species and individual variation must be carefully considered.

—R. GWATKIN.

See also abst. 556 (liver injury).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease).

— (1953). **Cornell conferences on therapy.** Vol. VI. [Edited by: GOLD, H.] pp. xxi + 287. New York & London: The Macmillan Co. \$4.50. 31s. 6d. 499

Cornell Conferences on Therapy were first inaugurated in 1937 as a joint venture of the departments of medicine and pharmacology at Cornell University Medical College. They are held throughout the academic year, limited to last one hour, half of which is taken up by an

informal discussion on subjects outlined by a clinician.

This volume, the sixth of a series, contains proceedings of fifteen of these conferences, which included, among others, papers on therapeutic application of some vasodilating agents, drugs and radiation in leukaemia, therapeutic use of combinations of antibiotic agents, ion-exchange resins, treatment of burns, bacterial endocarditis, osteoporosis and barbiturate poisoning.—E.G.

See also absts. 271 (quaternary ammonium compounds); 274 (iso-nicotinic acid hydrazide); 287 (effect of sulphonamides and antibiotics on *E. (Listeria) monocytogenes* in vitro); 295 (aureomycin for salmonella infections in calves); 296 (neomycin sulphate in calf salmonellosis); 301 (furazolidone in fowl typhoid); 310 (antibiotic action of hawkweed); 319 (bacteriostatic action of acid hydrazide on spore-forming anaerobes); 323 (effect of aureomycin and terramycin on *C. albicans* in faecal flora of poultry); 328 (isoniazid treatment of actinomycosis in a cow); 339 and 344 (antricyde); 340-341 and 343 (ethidium bromide); 377 (sulphonamides in Borna disease); 387 (thiocyanic acid compounds in hard pad disease); 388 (treatment of feline distemper and/or feline enteritis); 407 (rickettsial diseases); 419 (tetrahydronaphthalene against lice); 420 and 497 (dieldrin); 423 (insecticides); 424 (gamma-B.H.C.); 426 (methylenedioxyphenyl synergists for insecticides); 436-437, 442, 445 and 446 (anthelmintics); 453-455 (antibiotics in nutrition); 493 (effect of vitamin K on dicoumarol hypoprothrombinaemia in dogs); 519 (toxicity of chlorinated hydrocarbon insecticides); 522 (antibiotics as additives to bull semen); 532 (use of hormones for relaxation of the cervix in cattle); 533 (prevention of puerperal infections by sulphonamides and antibiotics); 557 (index of treatment in small animal practice); 558 (book, current therapy).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

BEATTIE, J. & CHAMBERS, R. D. (1953). **Oxygen consumption in heat-adapted animals.** — *Quart. j. exp. Physiol.* **38**, 55-60. 500

Adaptation of rats to an environmental temp. of 29.5°C. required a period of not less than 28 days. The heat equivalent of oxygen consumed by rats adapted to 29.5°C. was 657-679 Cal./sq.m./24 hours during May to August and 690-712 Cal./sq.m./24 hours during the remainder of the year in Britain.—R.M.

FANKHAUSER, R. (1952). **Einige Asymmetrieaspekte bei Tieren. [Asymmetry in animals.]** — *Schweiz. Arch. Neurol. Psychiat.* **70**, 151-155. 501

F. discussed the incidence of asymmetry in the animal kingdom, with reference to asymmetry of the skull in dogs, the ovary in birds, the kidneys in mammals, and to left or right limb preference in horses.—R.M.

PONDER, E. (1954). **Present concepts of the structure of the mammalian red cell.** — *Blood.* **9**, 227-235. [Interlingua summary] 502

P. reviewed present knowledge of the surface and interior of the mammalian r.b.c. He discussed the determination of thickness of the surface layers, their structure, constituents, and the presence of lipoprotein-haemoglobin complexes.—JOHN SEAMER.

QUICK, A. J., GEORGATSOS, J. G. & HUSSEY, G. V. (1954). **The clotting activity of human erythrocytes: theoretical and clinical implications.** — *Amer. J. med. Sci.* **228**, 207-213. [Authors' summary slightly modified.] 503

Human erythrocytes contain a clotting factor which is characterized by the high consumption of prothrombin that is induced when added to normal platelet-free plasma. Its action is independent of platelets but it requires throm-

boplastinogen for its activity, being inactive when added to blood from severe cases of haemophilia. In very mild haemophilia the slight escape of this clotting factor from erythrocytes may bring the time for the consumption of prothrombin into the normal range; therefore, the test is more reliable for diagnosis when carried out on platelet-rich plasma than on whole blood. The physiological significance of the clotting factor in erythrocytes remains to be determined.

YOFFEY, J. M. (1954). **Bone marrow.**—*Brit. med. J.* July 24th, 193-197. [Author's summary modified.] 504

Y. described a quantitative technique for studying the nucleated cells of bone marrow. The three main cell groups in the marrow are (1) erythroid, (2) myeloid, (3) lymphocytes. In the marrow of 17 normal g. pigs the mean count of these cells per cu. mm. was approx.: erythroid, 273,000; myeloid, 390,000; lymphocyte, 310,000. In relation to the cell content of the blood, the marrow appears to possess a greater reserve of myeloid than of erythroid cells. Y. touched upon some of the problems to which the quantitative study of the bone marrow is being applied.

ERENÇİN, Z. (1952). Muhtelif geviş getiren hayvanlarda hemellenf yumrularının anatomik durumlarıyla, hemopoetik sistemdeki yerlerinin tesbiti (histolojik). [*Anatomical studies of haemolymph nodes of various ruminants and their importance in the haemopoietic system.*] — *Thesis, Ankara*. pp. 65. [Abst. from German summary.] 505

A general note on the structure of haemolymph nodes, with comments on the differences between these structures in sheep and in goats. —A.S.

GOODWIN, R. F. W. (1954). **Blood-sugar in foetal and neonatal mammals.** [Correspondence.]—*Nature, Lond.* 173, 777-778. 506

G. studied the distribution of glucose in the r.b.c. and plasma during the foetal and immediate post-natal stages in horses, cattle, sheep, goats, g. pigs and rabbits. In the foetal or immediate post-natal r.b.c. of these species the glucose content is approx. equal to that of the plasma. (G. designated this "state a".) A gradual change to a plasma high, r.b.c. low glucose content occurs at varying times during foetal or post-natal life, according to species. (He designated the latter state as "state b".) For example, the r.b.c. in the new-born pig are in "state a", while those of the foal at birth are already in "state b". A change

from "state b" to "state a" was not noted in any species nor did G. consider such a change to be physiological.—JOHN SEAMER.

BARRON, D. H. (1953). **A comparative study of the alkali reserve of normal, pregnant, and foetal sheep.**—*Yale J. Biol. Med.* 26, 119-125. 507

Earlier work indicated that the alkali reserve of the foetal blood (on caesarian section) was higher than that of maternal plasma after delivery, suggesting that the pregnant ewe or goat is in metabolic acidosis. New determinations on 10 pregnant and 12 control ewes showed that there was in fact no deviation from normal levels during pregnancy. In 6 ewes given pentobarbital sodium intravenously or a spinal anaesthetic and then restrained in a supine position for operation there was a drop in alkali reserve of 3-10 volumes % on the resting value. It was then found possible with 8 well-handled ewes to perform caesarian section by local anaesthesia in the absence of restraint; the alkali reserve was in no case altered by more than 3 volumes %, and the foetal levels proved to be about equal to, never exceeding, the maternal.—F. L. M. DAWSON.

BOSTROEM, B. & SCHOEDEL, W. (1953). Über die Durchblutung der arterio-venösen Anastomosen in der hinteren Extremität des Hundes. [*Blood-flow in the arterio-venous anastomoses of the hind leg in the dog.*]—*Pflüg. Arch. ges. Physiol.* 256, 371-380. 508

The authors estimated the proportion of blood flowing through arterio-venous anastomoses by injecting a known number of wax spherules 40 μ in diam., and then counting the number appearing in the venous blood. They found that 0-30% of blood passing through the limb did so by way of anastomoses. They also studied the effect of various agents on this blood flow.—R.M.

ROMAGNOLI, A. (1952). Metodi diretti ed indiretti di misurazione della pressione arteriosa nel cane. [*Methods for measurement of blood pressure in dogs.*]—*Ann. Fac. Med. vet., Pisa*, 5, 158-182. [English and French summaries.] 509

Among the direct methods, R. described a capacitance manometer (F. W. Noble, 1948), which registers the blood pressure through a hollow needle inserted into the artery. He discussed the various indirect procedures, with special reference to the techniques in current use in human medicine and which are applicable also to the dog, i.e., the palpatory, auscultatory

tory and oscillometric methods used in conjunction with an inflatable cuff. He gave an account of the use of an electroplethysmograph (described by Salpeter, 1951) for the measurement of the arterial pressure.—I. MARTINI.

STURKIE, P. D., WEISS, H. S. & RINGER, R. K. (1953). **Effects of age on blood pressure in the chicken.** — *Amer. J. Physiol.* **174**, 405-407. **510**

The systolic blood pressure of male fowls is 15-25% higher than that of females, depending on the age. The mean systolic pressure in females is 131 mm. Hg at 10-14 months as compared with 164 mm. Hg in males. It gradually increases in females to 163 mm. Hg at 42.54 months of age and in males to 188 mm. Hg at 34-54 months of age. The pulse rate in females is significantly higher than in males. Pulse rate is not causally related to body weight or blood pressure.—F.E.W.

ELIAS, H., BOND, E. & LAZAROWITZ, A. (1954). **The "normal" liver of the pig; is it an example of purely portal (and therefore subclinical) cirrhosis? A preliminary report.** — *Amer. J. vet. Res.* **15**, 60-66. [Abst. from authors' summary.] **511**

A preliminary report, based on a study of 5 livers obtained from apparently healthy pigs at an abattoir. The authors observed a form of portal cirrhosis of unknown aetiology in this material. They based their conclusions on the following similarities between the changes observed and the changes seen in cirrhosis in man: (1) portal and hepatic veins ran in the same septa, (2) there were occasional anastomoses between neighbouring portal veins, (3) the limiting plate [a single layer of liver cells which surrounds the portal and hepatic veins in man] was absent, (4) atrophic liver cells, a feature of many forms of human cirrhosis, were present in the septa, (5) new septa were formed under the influence of mechanical traction exerted on certain parts of the parenchyma.

The condition was benign, since anastomoses between portal and central lobular veins were absent. As a consequence there was no central necrosis. In the absence of central necrosis, vigorous regenerative expansion of nodules occurred sporadically. Therefore, there was no permanent flattening of hepatic veins, and hypertension did not develop.

Cirrhosis in man and experimental cirrhosis in rats is characterized by anastomoses between portal veins and between portal veins and cen-

tral lobular veins. Cirrhosis in the pigs examined was characterized by the former type of anastomoses alone.

BISWAL, G., MORRILL, C. C. & DORSTEWITZ, E. L. (1954). **Glands in the submucosa of the porcine colon.** — *Cornell Vet.* **44**, 93-192. **512**

Eight unweaned piglets, five 100 lb. and five 250 lb. pigs were studied. In the 10 older pigs glands were visible to the naked eye, mostly in the caudal part of the colon, from 0.5-5 mm. in diam. with surrounding lymphoid tissue, 300-800 in all. Glands were branched, of columnar and goblet (mucin-rich) cells. Ducts lead inconspicuously into the crypts of Lieberkühn or to the lumen surface. There is some danger that these structures may be confused with the results of pathological change.

—F. L. M. DAWSON.

ZUCKERMAN, S. (1954). **The secretions of the brain. Relation of hypothalamus to pituitary gland.** — *Lancet.* **266**, 739-743 & 789-796. **513**

Work in the 1930's indicated a direct control of the hypothalamus on the posterior pituitary through the stalk. There must be some direct nervous regulation of the anterior pituitary, because direct stimulation of the hypothalamus produces ovulation in the rat. But in contrast to the posterior pituitary there is no evidence of a secreto-motor innervation from the hypothalamus.

Investigating the chemo-transmitter possibility, all now agree that the direction of flow in the pituitary portal veins is downward, but Z. showed in work with ferrets that these structures need not be intact for the anterior pituitary "reflex effects" to take place. It remains possible that there may be a chemotransmitter conveyed *via* the systemic blood stream. Work since 1949 with Gomori's chrome-alum stain yielded much evidence that all 3 posterior pituitary principles are secreted in the hypothalamus; very little evidence exists that the pituitary secretes at all, the flow thither occurring from the nerve-cell body down the axon.

—F. L. M. DAWSON.

— (1953). **Renal function. Transactions of the Fourth Conference, October 22, 23 and 24, 1952, sponsored by the Josiah Macy, Jr. Foundation, New York.** [Edited by: BRADLEY, S. E.] pp. 189. New York: Josiah Macy Jr. Foundation. \$3.50. **514**

The aim of these conferences is, by making the discussion free and informal, to remove

difficulties of accepting data derived from methods which are unfamiliar.

This fourth conference comprised an introduction by F. Fremont-Smith; an informal discussion on ion exchanges between extracellular and intracellular fluids; cation exchanges in the

renal tubular epithelium, by G. H. Mudge; ion transport across living membranes, by H. H. Ussing; and water and ion movements across intestinal and renal epithelium, by M. B. Visscher. References are given at the end of each of the four discussions.—E. MARSH JONES.

See also abst. 553 (book, bacterial physiology).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

HOEKSTRA, J. (1954). Studies in verband met de houdbaarheid van vlees. [**Studies in connexion with the keeping quality of meat.**]—*Tijdschr. Diergeneesk.* **79**, 484-494. [English, French and German summaries.] **515**

An account of a method of sampling pork for bacteriological examination. Sterilized rubber stoppers are pressed on the surface and afterwards washed in saline, plate cultures being sown from the washings. H. prefers this method to the punching out of samples.

—C. A. VAN DORSSEN.

SEIDEL, G. (1954). Zur Frage der Bedeutung des Chlorophylls für die tierärztliche Lebensmittelüberwachung. [**Can chlorophyll be used to suppress odour in tainted meat?**]—*Mh. VetMed.* **9**, 204-206. **516**

S. carried out experiments to determine whether it would be possible fraudulently to suppress the smell of tainted meat by the use of chlorophyll in aqueous solution. He considered that this would not be possible, as, in the quantities needed, the chlorophyll imparted a noticeable green tinge to the meat.—A.S.

PARKINSON, H. (1954). A modern abattoir—before and after.—*J. R. sanit. Inst.* **74**, 81-88. Discussion pp. 88-90. **517**

An account of the conditions prevailing in Grimsby for the slaughter of animals before the opening of the new abattoir in 1953, and a somewhat guarded criticism of the present building. As the result of an endeavour to reduce distances walked and weights lifted by the employees, the buildings are too cramped and two floors with lifts and chutes are used instead of the more convenient single floor. One room only is available for combined use as laboratory and inspectors' cloakroom. Both supervision and inspection are entirely in the hands of Sanitary Inspectors, and investigations are made by the Pathology Department of the local hospital. [There is no veterinary supervision.]

—R. MACGREGOR.

STEINIGER, F. (1952). Rattenbiologie und Rattenbekämpfung einschliesslich der Toxikologie gebräuchlicher Rattengifte. [**Biology and control of rats, including toxicology of some rat poisons.**] pp. 149. Stuttgart: Ferdinand Enke. DM 11. **518**

This little book on the control of rats consists of chapters on the biology of rats, their role in the dissemination of diseases, and control by natural enemies, traps, diseases and poisons. About one half of the total number of pages of this booklet is dedicated to rat poisons, their use and action, and the clinical and *post mortem* picture and treatment of poisoning in domestic animals and man if by accident they get poisoned from the use of material laid down for rats. There are also chapters on the organization of rat control and rat-proofing of buildings, yards, refuse dumps, etc. There are thirty-three line illustrations and there is a list of references at the end of the booklet. It is paper-bound, but paper and print are adequate.—E.G.

BALL, W. L., SINCLAIR, J. W., CREVIER, M. & KAY, K. (1954). Modification of parathion's toxicity for rats by pretreatment with chlorinated hydrocarbon insecticides.—*Canad. J. Biochem. Physiol.* **32**, 440-445. **519**

The resistance of rats to poisoning by organic phosphate insecticides, was greatly increased by oral pretreatment with chlorinated hydrocarbon insecticides. This may be due to an increased serum alisterase which is capable of hydrolyzing organic phosphates.

—R. GWATKIN.

TOTZEK. (1953). Zur Frage der Studienreform in der Veterinärmedizin. [**Proposed changes in veterinary education.**]—*Prakt. Tierarzt.* No. 11, pp. 229-232. **520**

T. recommended that students should specialize either in curative veterinary science or in preventive veterinary science. The latter would provide training for food inspectors, municipal posts, and directors of abattoirs.

—R.M.

REPRODUCTION AND REPRODUCTIVE DISORDERS

GOLLBECK, E. (1954). Tierärztliche Erfahrungen bei der Überwachung der Bullenhaltung. [Veterinary supervision of the management of bulls.]—*Fortpflanzung*. 4, 55-59. [English summary.] 521

G. discussed bull-management and the economic importance of venereal infection. He advocated close collaboration between bull handlers and supervising veterinary surgeons.—A.S.

WILLETT, E. L. (1952). Fertility of bull semen diluted: 1:100 and 1:300 with and without antibiotics.—*Rep. IInd Int. Congr. Physiol. anim. Reprod., Copenhagen*, 1952. 3, 126-129. [In English. French and German summaries. Author's summary modified.] 522

In two factorial experiments designed to reveal the difference in non-return rate between bull semen diluted 1:300 in the presence of sulphanilamide and antibiotics together, and semen similarly diluted in the presence of sulphanilamide alone, there was only a slight and insignificant difference. Statistical analysis of the data indicated that reduction in spermatozoan numbers was largely responsible for the difference between dilutions of 1:100 and 1:300. Other effects of dilution were of little importance. Antibiotics caused a significant improvement in the breeding efficiency of semen. As the number of spermatozoa was reduced from 12 to 4 million there was a decline in efficiency of the order of 0.5% non-return per million reduction in spermatozoan numbers. On this basis a reduction from 12 million to 4 million spermatozoa would involve a drop of 4-6% in non-return rate.

VAN RENSBURG, S. W. J. & ROWSON, L. E. A. (1954). The fertilising capacity of frozen bull semen after long distance aerial transport.—*Vet. Rec.* 66, 385-386. [Authors' summary slightly modified.] 523

Bull semen was collected at the Cambridge Cattle Breeding Centre, diluted 1:24 in the presence of 10% glycerol, frozen, and transported by air to Onderstepoort Veterinary Research Laboratory, in South Africa, where it was stored in dry ice at -79°C . Over a period of four and a half months 39 cows in two herds were inseminated with this semen. Seven of these cows were subsequently found to be sterile or to have very poor fertility. Conception resulted in 23 cows, 19 of which conceived after one insemination, three after two, and one after three inseminations. The fertilizing capacity

of the semen was not impaired by all the handling and exposure involved and by the subsequent storage. The first calf has now been born and appears perfectly normal.

LIKAR, I. & LIKAR, L. (1954). Kritische Bemerkungen über die Werte und Bestimmungsmethoden von Vitamin C in Hengst- und Stierejakulaten. [Critical observations on the determination and content of vitamin C in the ejaculate of stallions and bulls.]—*Fortpflanzung*. 4, 137-140. [English summary.] 524

The authors discussed difficulties in the determination of vitamin C in semen. Vitamin C is readily oxidized, particularly in the presence of copper ions, and these are commonly present in stored semen because the death of a small proportion of the spermatozoa leads to the release of copper ions from the protein complexes in which they are fixed during life. The authors blocked the catalytic action of the free copper ions by adding potassium ferrocyanide. This, did not however, entirely inhibit breakdown of the vitamin, and they concluded that other catalysts were present. On the basis of their experiments they recommended that tests for vitamin C should be carried out on fresh semen, with formaldehyde controls. They considered Devjatnin's modified test to be superior to the standard test described by Emmerie and Eekelen.—A.S.

EL-SHEIKH, A. & CASIDA, L. E. (1954). The independence of motility and fertility as physiological phenomena of rabbit spermatozoa.—*J. anim. Sci.* 13, 660-667. [Authors' summary slightly modified.] 525

Motility and fertility variations of rabbit spermatozoa were induced by experimentally altering pH and osmotic pressure. Four different buffer systems were used as sperm diluents. The first study was designed to determine for each buffer system the optimum molality (molal concentration) and pH for motility as well as hypertonic and hypotonic concentrations, and pH values which would support some motility but at a low level. In the second experiment these particular variations in pH and molality were studied to determine their effects on the relation between motility and fertility. The differences in fertility in the experimental diluents from the fertility in the control diluents per unit difference in motility were found to differ significantly from one experimental diluent to another. These results showed that

motility *in vitro* and fertility are phenomena which may or may not be affected similarly by an environmental factor.

LAKE, P. E. (1954). **The relationship between morphology and function in fowl spermatozoa.** — *Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 79-85. [English and French summaries: pp. 14-15 of Summaries of Section Papers.] [Author's summary copied *verbatim*.] 526

The problem of maintaining fowl spermatozoa in a functional state *in vitro* is rendered difficult by the presence in the semen, usually collected by the massage technique, of various accessory fluids. These fluids are derived from the rectum, ureters and epithelial glands in the cloaca, and certain of them have been shown to have a detrimental effect on the structure of the spermatozoon. The relationships between spermatozoon function and structure in the male tract, under various *in vitro* conditions and in the female tract have been, and are being studied, in an attempt to gain fresh knowledge for the further development of an *in vitro* storage technique for fowl spermatozoa. Basic structure of the spermatozoon has been established which reveals the presence of an outer cytoplasmic layer as part of its normal morphology. From a knowledge of its chemical and physical composition, it is thought that methods might be devised to stabilise the outer layer by either precipitation, adsorption of protective substances, or the combination within its structure of protective substances. This would prevent the diffusion of obnoxious substances into the chromosome material of the head, and also prevent the disruption of the midpiece. Both of these structural points are shown to be essential to the retention of fertilizing power by the spermatozoon.

NISHIYAMA, H. (1954). **Studies on the reproductive physiology of the cock. V. The influence of androgen on the accessory organs of the phallus.** — *Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 88-91. [English and French summaries: p. 16 of Summaries of Section Papers.] [Author's summary modified.] 527

In order to investigate the response of the accessory organs of the phallus (rudimentary copulatory organ), a daily dose of 0.5-5 mg. of testosterone acetate (total 52.5 mg.) was injected for 25 days into adult capons. In addition they were given oestrone benzoate to the amount of about one thirtieth of the testosterone injected. The degenerated accessory organs

of the phallus in these capons increased in weight or size to those of a normal cock, they became functional as glands, and transparent fluid was secreted by them in a quantity sufficient to be collected.

— (1952). Über den Befruchtungsprozess bei Pflanzen und Tieren. [**The process of fertilization in plants and animals.**] [German translation edited by HÖPPNER, W.] Sowjetwissenschaft. Suppl. No. 31. pp. 319. Berlin: Kultur und Fortschritt. DM 8.40. 528

This work consists of German translations of papers by Soviet scientists, the originals of which have appeared in various Soviet publications during 1948-52.

S. G. Davydov and M. P. Libisov in a paper on heterospermic fertilization in farm animals discussed the "old" conception that in most animals only one spermatozoon takes part in the fertilization of the ovum, that all spermatozoa of the same species have a similar fertilizing capacity and that the nucleus plays a major part in the process. They stated that Soviet scientists were able to prove that the number of spermatozoa taking part in the initial phase of fertilization was enormous, and that nearly always more than one male germ cell enters the ovum. According to Lysenko fertilization is a specific mutual assimilation process between the fusing male and female germ cells and therefore the number of male cells taking part in it is considered to be of importance.

M. M. Lebedev, in a paper on polyspermic fertilization in animals, reported on experiments with New Hampshire hens mated with a Wyandotte and an Australorp cock within a few minutes of each other. The F_1 generation, however resembled either one or the other of the two cocks, but by mating whites with whites and blacks with blacks of the F_1 generation, it is claimed that among each of the two groups of the resulting F_2 generation there were fowls resembling Australorps as well as fowls having the characteristics of the Wyandotte breed. Results with controls mated only with one cock appeared to support the authors' claim.

F. C. Bulchanov, in a paper on insemination in ewes with a mixture of semen of two rams stated that all ewes inseminated became pregnant and the ratio of lambs per 100 ewes averaged 138. Of controls inseminated with semen from only one ram 95% became pregnant and 100 ewes averaged 102 lambs.

The paper on increased fertility in pigs by M. M. Lebedev and I. M. Pitkjanen gave data on 125 sows mated in quick succession with two

boars. Contrary to the belief that ovulation in sows is spontaneous, the higher percentage of pregnancies and the larger number of piglets produced appeared to indicate that ovulation can be stimulated by double service.

Other papers dealing with the fertilization process in animals on similar lines and included in this volume were on the number of spermatozoa taking part in the fertilization process, by D. I. Genin and on the relationship between fertilization and vitality and sex of offspring, by W. K. Milovanov.

There are lists of references after each paper, mainly to Soviet literature. Paper and print are good.—E.G.

MOSS, S., WRENN, T. R. & SYKES, J. F. (1954). **Alkaline phosphatase, glycogen, and periodic acid-Schiff positive substances in the bovine uterus during the estrous cycle.**—*Endocrinology*. **55**, 261-273. [Authors' summary modified.] **529**

Alkaline phosphatase and glycogen were determined in tissue sections obtained from the uterus of 20 cows killed at various stages of the oestrous cycle. In the endometrium alkaline phosphatase was always present in the intercotyledonary areas of the upper, densely cellular stroma, in the fibrous sheaths of gland tubules and blood vessels, and in the distal borders of the surface epithelial and superficial gland cells. The capillary endothelium showed phosphatase activity in all parts of the uterus.

A distinct cyclic variation of phosphatase activity was seen only in the surface epithelial cells (with the exception of their distal borders, in which phosphatase activity was always present). In these the highest activity was seen during the mid-cycle, but little or no activity was present for several days at the beginning and at the end of the cycle. The presence of phosphatase activity in the stroma fibres of the uterus seemed to be dependent on an association with the endometrial glands. The amount of phosphatase activity present in the endometrial stroma seemed to be related to the extent of fibrous development.

Glycogen was often found inside small round cells in all parts of the upper endometrial stroma or loose in the cotyledonous, upper endometrial stroma, in superficial and occasionally also in intermediate glands, in the walls of some large blood vessels of the myometrium, in the longitudinal muscle and in the surface epithelium. A pronounced cyclic variation of glycogen distribution was found only in the surface epithelium. However, in contrast to

phosphatase distribution the largest amount of glycogen was seen for several days at the beginning and at the end of the cycle, but no glycogen was found during the mid-cycle.

POZO LORA, R. (1954). Contribución al conocimiento del diagnóstico precoz de la gestación en la yegua por las modificaciones citológicas del moco vaginal. [**Diagnosis of pregnancy in the mare by cytological modifications in vaginal mucus.**]—*Arch. Zootec., Cordoba*. **3**, 103-140. **530**

The author examined 1,100 vaginal smears from 106 mares, in a search for cytological changes characteristic of oestrus or of pregnancy. There was no change in the cytological picture during oestrus, but after the 20th day of pregnancy there were characteristic changes permitting a definite diagnosis. Of these the most typical were the appearance of filiform cells and small agglomerations of mucus. Shed ciliate cells of the vaginal epithelium also, particularly when associated with numerous leucocytes, were an indication of pregnancy. Mares which failed to conceive after service yielded smears containing granular mucus and leucocytes, but no other cellular material.—A.S.

VARIČAK, T. (1954). Über Korrelation der morphologischen Veränderungen der Uterusschleimhaut trächtiger Stuten und Choriongonadotropinausscheidung. [**Correlations between morphological changes of the uterine mucous membrane of pregnant mares and the excretion of chorionic gonadotrophin.**]—*Dtsch. tierärztl. Wschr.* **61**, 223-224. **531**

The author described changes in the uterus of the pregnant mare between the 5th and 22nd weeks. During this period there occurs a sloughing of patches of mucous membrane, forming depressions which he referred to as "craters", these being most noticeable at about the 9th week. Regeneration of the mucous membrane is complete by the 22nd week. These histological changes are closely related with titre of chorionic gonadotrophin in the mare's blood. This hormone is first detectable at the 6th week, is present in greatest quantity at about the 9th week, and is no longer detectable after the 22nd week.—A.S.

JÖCHLE, W. (1954). Zum Problem der Zervixpassage beim Rind. [**Use of hormones to effect relaxation of the cervix in cattle.**]—*Fortpfl. ZuchtHyg. Haustierbesamung*. **4**, 85-87. [English summary.] **532**

After mentioning mechanical methods J. discussed the use of hormone preparations to

bring about relaxation of the cervix in cattle. He made frequent reference to work in the same field in human medicine.—A.S.

GÖTZE, R. (1953). Bekämpfung der puerperalen bakteriellen Erkrankungen des Pferdes und Rindes durch die prophylaktische Therapie mit Sulfonamiden und antibiotischen Mitteln. [Prevention of puerperal infection in cows and mares by use of sulphonamides and antibiotics.] — *Proc. XVth Int. vet. Congr., Stockholm, 1953*. Part I. Vol. 2. pp. 773-777. Discussion: Part II. pp. 338-340. [In German. English and French summaries.] 533

At the Hanover Veterinary College local and general treatment with sulphonamides and/or antibiotics was instituted in all cows and mares which had aborted, or which had had difficult parturition or retention of the placenta. As a result there was a reduction in the number of deaths from metritis and its complications; this reduction was greater in mares than in cows. —R.M.

CHRISTENSEN, N. O. (1953). Impotentia coeundi in boars due to arthrosis deformans.—*Proc. XVth Int. vet. Congr., Stockholm, 1953*. Part I. Vol. 2. pp. 742-745. Discussion: Part II. pp. 332-333. [In English. French and German summaries.] 534

An account of impotentia coeundi in 8 boars aged 9-18 months and one boar aged 3 years, due to severe lameness caused by deformity of the head of the femur and of the bones of other joints. Histological examination of affected joints revealed degenerative changes in the cartilage, sometimes with rarefaction and consolidation of the underlying bone, and chronic proliferative inflammation of the joint capsule. Bacteriological examination was negative. The semen and reproductive tract were normal. Some of the boars were related. Discussing C.'s paper, H. Behrens stated that he had seen a similar condition at Hanover. —R.M.

JOHANSSON, I. & KORKMAN, N. (1952). Heritability of the udder proportions in dairy cows.—*Hereditas, Lund*. 38, 131-151. [In English.] 535

The authors estimated the udder proportions of 592 cows of the Swedish Red and White, Swedish Friesian, and Swedish Polled breeds by measuring and comparing the volume of milk obtained from each quarter. The front half of the udder produced an average of 41% of the total milk yield. From the data ob-

tained, they concluded that the inheritance of udder proportions was simple, and that it should not be difficult to select cows for improved symmetry, i.e., equality, as near as possible, between fore and hind quarters.

—R.M.

DONALD, H. P. & WIENER, G. (1954). Observations on mandibular prognathism. — *Vet. Rec.* 66, 479-482. [Authors' summary modified.] 536

The authors surveyed the incidence and degree of prognathism in 459 dairy and beef type cattle. In the sample of animals available, dairy type stock was less affected than beef type stock. They discussed the genetical aspects of the problem in relation to bull licensing.

HOLZ, K. (1954). Angeborene Missbildung und akute Entzündung des Zentralnervensystems beim Schwein. [Congenital malformation and acute inflammation of the central nervous system in pigs.] — *Dtsch. tierärztl. Wschr.* 61, 263-266. 537

In two unrelated litters of unthrifty piglets, which died suddenly at the age of 4 weeks and 8 days, respectively, there were marked abnormalities of the spinal cord, including partial duplication of the cord, asymmetry of the grey matter, and partial obliteration of the central canal. There were also acute inflammatory changes in the brain and spinal cord, which were presumably the cause of death. H. concluded that the abnormalities were responsible for a reduction in the growth rate, and an increased susceptibility of the central nervous system to infection.—R.M.

HUBRIG, T. (1954). Gehäuftes Auftreten blindgeborener Ferkel in Thüringen. [Increased incidence of congenital blindness in piglets in Thuringia.] — *Mh. VetMed.* 9, 132-136. 538

H. described a condition which he saw in a number of litters in Thuringia in the spring of 1953. The eyes were severely malformed, being either minute beneath sunken, tightly-shut lids, or of great size and standing out noticeably from the head. The internal structures of the eyes were not properly developed. Some of the piglets also had paresis of the forelimbs and made unnaturally restricted "tripping" movements with the hind limbs.

Bacteriological investigation of sows and litters revealed no infective organisms, and the circumstances made inbreeding an unlikely explanation.

After considering the diet H. diagnosed

vitamin A deficiency, and quoted references to support his view. He recommended the use of vitamin A-rich fodder.—A.S.

WILLIAMS, H. D. & WILLIAMS, T. (1952). The inheritance of horns and their modifications in polled Hereford cattle. — *J. Hered.* 43, 267-272. 539

The authors described six phenotypes in connexion with horns or absence of horns in herds of polled Hereford cattle in Ohio. They discussed theories of inheritance of horns, and

suggested that the existence of four pairs of alleles offered the best explanation of the observed phenomena.—R.M.

PULLIG, T. (1953). Anury in cocker spaniels. — *J. Hered.* 44, 105-107. 540

P. investigated the ancestry of four Cocker Spaniel puppies, from different litters, which were born without tails, and performed breeding experiments with their descendants. Although the condition appeared to be inherited by a recessive mechanism in some cases, it was not inherited in others.—R.M.

See also absts. 305-313 (brucellosis); 314 (non-specific venereal infections in cattle); 339 (dourine); 348-350 (trichomoniasis); 380 (virus abortion of mares); 385 (enzootic abortion in ewes); 417 (inheritance of blood groups in dogs); 469 (experimental nutritional congenital hydrocephalus); 492 (pathology of the reproductive system in hyperkeratosis); 541 (methods for cooling laying hens); 560 (book, mating and whelping of dogs).

ZOOTECHNY

HART, S. A. & WILSON, W. O. (1954). A preliminary report on two methods for cooling laying hens. — *Papers presented to Xth World's Poult. Congr.*, Edinburgh, 1954. pp. 330-332. [English and French summaries: pp. 70-71 of Summaries, of Section Papers.] [Authors' summary modified.] 541

Experiments conducted at the University of California led to the following observations. Evaporative cooling of the bird rather than change of the micro-climate was the effective agent in increasing the comfort of fowls exposed to high environmental temp. Atomizing water within the poultry house was an effective cooling device if the birds were wetted. With satisfactory wetting of the fowl, panting ceased, or was significantly reduced, for as long as half an hour. Some reduction in skin temp. and an increased interest in food resulted. Sprinkling water on the roof did not appear to be a particularly satisfactory method of cooling fowls.

EVERIST, S. L. & MOULE, G. R. (1952). Studies in the environment of Queensland. II. The climatic factor in drought. — *Qd J. agric. Sci.* 9, 185-299. 542

The authors established correlations between periods when flocks of sheep have suffered from shortage of pastures due to a lack of effective rain, and the precipitation in these periods, thus enabling climatic criteria for drought to be established.

Rainfall records for parts of Queensland from 1894 to 1951 were examined to determine the frequency and duration of drought. It was shown that droughts are normal in the climate of semi-arid Queensland, and that they vary

widely from a single bad year to a succession of mediocre or mediocre and bad years. No evidence of cycles of drought was obtained. The authors discussed the effect of drought on various types of sheep husbandry. The conclusions do not necessarily apply to cattle raising or crop production.—R. I. SOMMERVILLE.

FILMER, J. F. (1953). The role of veterinary surgeons in the dairy, meat and wool industries of New Zealand. — *N. Z. vet. J.* 1, 83-86. 543

F. discussed problems related to rates of production and stocking in livestock husbandry. He suggested that the potential productive capacity of New Zealand cattle is greatly underestimated: He made a plea for closer liaison between the veterinary practitioner and the research worker, particularly in the field of animal husbandry.—W. S. MARSHALL.

BRANDLY, C. A. (1954). Our poultry industry. — *N. Amer. Vet.* 35, 440-441 & 449. 544

B. mentioned a method of overcoming broodiness in hens by injecting 30 mg. diethyl stilboestrol (DES.) s/c. in 3 ml. sesame oil. An oily soln. is more readily absorbed than commercial pellets, an important factor as the birds cannot resume laying until the effects of the DES. are dissipated. Broody turkey hens require up to 200 mg. of DES. in sesame oil.

Pullets which recover from infectious bronchitis frequently become false layers: the ovary develops normally, but the oviduct is stunted, and the yolks are resorbed in the peritoneal cavity. Such birds are not easily distinguishable from normal birds, as they visit the nest boxes in the normal way. They are best detected by trap nesting.—A.S.

TECHNIQUE AND APPARATUS

RISHBETH, J. (1954). **The wet-film Indian ink method for examining micro-organisms.** [Correspondence.]—*Nature, Lond.* 174, 361-362. 545

R. used the wet-film Indian ink method to demonstrate unicellular organisms, bacterial spores, yeast cells and fungi. The ink used had small uniformly sized particles. Preparations were suitable for photography.—D. POYNTER.

GOLDACRE, R. J. (1954). **A simplified micro-manipulator.** [Correspondence.]—*Nature, Lond.* 173, 45. 546

G. described a simply constructed micro-manipulator, consisting of glass components "cemented" together with sealing wax, which permits fine movements in 3 dimensions. The moving parts are small slides of glass held together by the adhesive action of vaseline, or, for finer adjustments, a mixture of vaseline and hard paraffin. An accuracy of movement of one micron is attainable. A suitable accessory such as a needle, a small pipette, a hook, a micropipette or an electrode, is attached to one of the glass components. Using several such manipulators, set up on the same microscope stage, and each carrying a different instrument,

G. had carried out a number of microsurgical operations.—JAS. G. O'SULLIVAN.

KRZYMOWSKI, T. (1953). Nowy sposób pobierania szpiku kostnego od zwierząt. [Collection of bone marrow.]—*Méd. vét., Varsovie.* 9, 548-550. 547

K. found that the following method for the collection of a sample of bone marrow from domestic animals is convenient. The needle is inserted into a rib near the junction of the bone and the cartilaginous part (about 2 cm. from the junction in horses and cattle and about 0.5 cm. in sheep and dogs), the former animals being in the standing position and the latter two lying on the left side. Smears should be made within 5-10 sec. after aspiration and held at room temp. for 2-3 days to dry before staining.—J. R. MITCHELL.

KASSEL, B. & LEVITAN, S. (1953). **A jugular technique for the repeated bleeding of small animals.**—*Science.* 118, 663-664. 548

The authors described a technique which can be performed without assistance and by which it was possible to obtain blood samples from young mice, and from older mice twice weekly for 6 weeks.—JOHN SEAMER.

MISCELLANEOUS

WADDINGTON, C. H. (1951). **Operational research.**—*Anim. Breed. Abstr.* 19, 409-415. 549

W. defined "operational research" as the scientific analysis of the problems which face any executive who is trying to carry out an enterprise of any sort. After a few examples taken from the major strategy of the second world war, showing the way in which the results of different approaches to a problem could be calculated and compared, he described how he and his staff had adopted an "operational" attitude to the problems of cattle breeding after the war. They had had to decide

whether the aim of cattle-breeding in England should be to prolong the productive life of a cow or to increase its yield per lactation. Calculation showed that one extra lactation, in its profit to the farmer, was equivalent to an increase in yield of only 35 gal. per lactation. Breeding had therefore to be aimed at raising yield per lactation rather than at prolonging productive life.

W. gave this example only as one of several illustrations of his theme that a scientific attitude to the basic questions of policy is essential to any administrator, no matter what his speciality may be.—D. S. RABAGLIATI.

REPORTS

NYASALAND PROTECTORATE. (1954). **Annual report of the Department of Veterinary Services and Animal Industry, 1953.** [FAULKNER, D. E.] pp. 36. Zomba, Nyasaland: Govt. Printer. 2s. 6d. 550

The Annual Livestock Census figures were:—cattle, 279,436; sheep and goats, 346,792;

pigs, 56,280—a very small animal population in relation to the human population and to the Territory. European-owned cattle showed an increase of over 5%. The number of cattle slaughtered for food was offset to some extent by imports from Portuguese East Africa. Animal mortality was lower than in previous

years owing to better husbandry, greater co-operation by the Native Authorities, and better disease control. Many diseases were dealt with and mortality was heaviest from TRYPANOSOMIASIS, TICK-BORNE DISEASES and RABIES.

Arsenical dips were considered the most efficient and economical method of tick control. For TRYPANOSOMIASIS (caused by *T. vivax* in cattle and *T. simiae* in pigs) dimidium bromide was used in conjunction with other measures—bush clearing and "hexidole" in dips. Fifty-nine cases of RABIES were confirmed and anti-RABIES measures included immunization with the avianized virus vaccine described by Flury and the destruction of stray dogs. TB. was diagnosed at meat inspection in one pig and four cattle. Two positive reactors to the tuberculin tests were slaughtered. Strain 19 vaccine was locally prepared for the control of CONTAGIOUS ABORTION in cattle. FOWL TYPHOID and FOWL POX were diagnosed and the former was treated with live vaccine. Sulphamethazine and sulphaquinoxaline were used with great success in avian COCCIDIOSIS.

Considerable progress was made in the housing of native cattle, providing better hygienic conditions and protection from predatory animals. Animal Husbandry benefited greatly from the establishment of Livestock Improvement Centres and of Education and Training Centres for Africans. A Poultry Breeding Centre was started with a view to relieving the meat shortage.

—T. E. GATT RUTTER.

— (1954). Verslag van de Veeartsenijkundige Dienst, jaar 1952. [Report of the Director of Belgian Veterinary Services, 1952.]—*Vlaam. diergeneesk. Tijdschr.* 23, 95-105. 551

Work on the control of TUBERCULOSIS was hampered during the year 1951-52 by the severe outbreak of F. & M. disease. Nevertheless, 1,200,000 cattle were tuberculin tested, and 190,000 of them reacted positively. More than 11,000 cattle with TB. were slaughtered, and TB. of the udder was confirmed in 458 cows. Many public lectures and film shows were given to popularize the campaign against TB. in cattle. In September 1951 F. & M. DISEASE, caused by type A₃ virus, swept across Belgium, followed in January 1952 by type C. During the latter year 1,500,000 cattle were vaccinated against F. & M. disease with monovalent or polyvalent vaccines, of which 21,000 litres were produced by the Veterinary Laboratory of Belgium, and 11,000 litres imported. One hundred and forty-seven thousand cows were artificially inseminated (99,000 in 1951). Legislation came into force to provide for artificial insemination in herds infected with *Trichomonas*. The incidence of ANTHRAX increased from 56 animals in 47 parishes in 1951 to 76 animals in 72 parishes in 1952. Investigations into the control of *Hypoderma* infestation in cattle by the topical application of a preparation containing rotenone were continued, with good results: 200,000 cattle were thus treated, the majority of them once only. MANGE was confirmed in 55 horses. SHEEP SCAB was confirmed in one sheep.—C. A. VAN DORSSEN.

BOOK REVIEWS

MANDE, R. [Médecin des Hôpitaux de Paris.] (1954). Manuel pratique de vaccination par le B.C.G. [B.C.G. vaccination manual.]—pp. iv+200. Paris: Centre International de l'Enfance. Fr. 950. 552

This book describes in general terms the technique to be used and the circumstances in which B.C.G. vaccination is advisable, and gives an account of complications which may arise after vaccination. There are also chapters on the principles of the method, the development of allergy after vaccination, and on TB. in cases where it appears after B.C.G. vaccination.—A.S.

OGINSKY, E. L. & UMBREIT, W. W. (1954). An introduction to bacterial physiology. pp. xi+404. San Francisco: W. H. Freeman & Co. (London: Bailey Bros. & Swinfen, Ltd.). 553

The book forms part of a series of biology texts and deals with the subject in six sections:—The nature of bacterial physiology, bacterial anatomy, population, metabolism, variations on a theme (autotrophs, viruses, etc.), and the capacity of the cell. The importance of bacterial physiology as a basic discipline is stressed, the intention of the authors being to bridge the gap between general bacteriology and more specialized studies.

The style of presentation is forceful and crisp, with abundant appeal to analogy in explaining cell mechanism, and a rather pleasant iconoclasm is displayed when discussing controversial issues such as the lipid capsule of the tubercle bacillus, and the Pasteur effect. The general effect of the book is to stimulate thought, and it could be read with advantage by the biochemist and bacteriologist alike. The book befits its title as an excellent introduction

to the subject, but reading occasionally becomes a little heavy, when, for example, the treatment of metabolism suffers from over-condensation and a lapse occurs into standard textbook presentation.

The sections are headed with unusual artistic conceptions of the bacterial cell, and each chapter has a list of review articles and books, with a few pertinent examination-type questions. The artistic printing of formulae in reaction cycles appeared rather confusing to the reviewer, but in general, the diagrams and graphs are well-executed and clear.

—A. B. PATERSON.

CONANT, N. F. [Professor of Mycology and Associate Professor of Bacteriology, Duke University School of Medicine], SMITH, D. T. [Professor of Bacteriology and Associate Professor of Medicine, Duke University School of Medicine], BAKER, R. D. [Professor of Pathology, Duke University School of Medicine], CALLAWAY, J. L. [Professor of Dermatology and Syphilology, Duke University School of Medicine] & MARTIN, D. S. [Chief, Bacteriology Section, Communicable Disease Center, Chamblee, Georgia] (1954). **Manual of clinical mycology.** pp. xii+456. Philadelphia (& London): W. B. Saunders Co. 2nd Edit. 32s. 6d. 554

The first edition of this *Manual* having proved its worth and gone out of print, the appearance of a second edition is a most welcome event.

The new *Manual*, re-set in a similar but improved format, has been revised throughout and contains 105 more pages and 54 more figures than the first edition. Its general arrangement is unchanged and each of the 26 mycoses of man which are included is succinctly dealt with on a common plan. After the disease name and important synonyms, there follows a brief assessment of the disease and then sections devoted to symptomatology, mycology, pathology, immunology, differential diagnosis, prognosis, and treatment, and in conclusion a bibliography of useful references.

Although this work has a medical bias it can be warmly recommended to any veterinary practitioner or research worker interested in mycoses for many of the pathogens dealt with also affect animals and the *Manual* thus provides useful help for the diagnosis of mycotic infections in animals and often gives suggestions for their treatment.—G. C. AINSWORTH.

tem, the endocrine system and the electrolytes in their relationship to clinical medicine. pp. xxxiii+746. New York, N.Y.: Froben Press, Inc. \$15.00. 555

This volume arranged in ten sections comprises 43 chapters. The theme is based on the cell as the structural and functional unit of the human body and the behaviour of the cell in health and disease. In health the chemical composition of the cells composing the various tissues, and that of their environment, is kept constant by the autonomic nervous system, the endocrine system and by the electrolytes. In disease the cell membrane first loses its normal function, becoming increasingly permeable with consequent loss into the circulation of vital chemical components of the cytoplasm; this results in changes in the chemical balance of the cell and its environment and in its structure.

The activities of various tissue cells of the human body under normal conditions and how the cells are affected by noxious agents of exogenous or endogenous origin are discussed. Information presented clearly, in an easily readable form, is based on facts widely scattered throughout medical and allied literature. There is a very extensive bibliography, and an index.—E. MARSH JONES.

— (1954). **Liver injury. Transactions of the Twelfth Conference, September 21, 22 and 23, 1953, Princeton, N.J.** [Sponsored by the Josiah Macy, Jr. Foundation.] [Edited by: HOFFBAUER, F. W.] pp. 231. New York: Josiah Macy, Jr. Foundation. 556

The papers were:—"The liver and carbohydrate metabolism", by E. Lundsgaard; "The liver and fat metabolism", by S. Gurin; "Cardiovascular lesions in choline-deficient rats", by W. S. Hartroft; and "The liver and protein metabolism", by H. W. Kosterlitz.—A.S.

KIRK, H. (1954). **Index of treatment in small-animal practice.** pp. vii+888. London: Baillière, Tindall & Cox. 3rd Edit. 45s. 557

It is three years since the publication of the second edition of this book [V.B. 21, 3118]. Recent advances are reflected in this third edition by the insertion of an antibiotics section in the chapter on antiseptics, and by descriptions of the latest methods for the prophylaxis and treatment of distemper, and canine virus hepatitis. Another new section deals with the preventive vaccination of dogs for the control of rabies. A list of proprietary preparations with the names and addresses of their makers has been added. Various changes, additions, and corrections have been made to the Index

STAMBUL, J. (1952). **The mechanisms of disease. A study of the autonomic nervous sys-**

of Therapeutics, which forms the major part of the book. This section is 30 pages longer than in the previous edition.—R.M.

- (1954). **Current therapy 1954. Latest approved methods of treatment for the practicing physician.** [Edited by: CONN, H. F.] pp. xxxii+898. Philadelphia (& London): W. B. Saunders Co. 55s. 558

The purpose of this voluminous annual is to inform medical practitioners of current methods in treatment. The contents are divided into sections on infectious diseases, diseases of the respiratory, cardiovascular, digestive, endocrine, urogenital, nervous and locomotor systems, diseases of the blood and spleen, metabolic and nutritional disorders, allergic, venereal and skin diseases, obstetrics and gynaecological conditions and diseases caused by physical and chemical agents. The section on infectious diseases contains, among others, articles on the treatment and immunology of undulant fever, food poisoning, psittacosis, Q fever, rabies, rat-bite fever, tetanus, tularaemia, murine typhus and leptospirosis. There is an index of drugs and a general index. Print, paper and binding are of very good quality.—E.G.

- CLAY, H. H. (1954). **The Public Health Inspector's handbook. (Formerly The Sanitary Inspector's handbook.) A manual for Public Health Officers.** pp. xx+608. London:

H. K. Lewis & Co. Ltd. 8th Edit., revised and enlarged. 30s. 559

This is the eighth edition of the book (which has been previously reviewed in this Bulletin), but under a new title, suggested by the report of a working party appointed by the Minister of Health in 1951, in which the term "Public Health Inspector" was recommended for the old designation of "Sanitary Inspector".

Opportunity has been taken to bring the work completely up to date and every chapter has been revised and much new material—technical and administrative—added.

Amongst additions, mention may be made of the Pet Animal Act, 1951, the new Memo 3/meat, which supersedes the well known Memo 62/ Food, a note on myxomatosis in rabbits and a new instruction issued by the Ministry of Food in 1953, *i.e.*, Circular M.F. 21/53, to provide improved safeguards against the possible misuse of condemned meat and offals.

—D. S. RABAGLIATI.

- GRAHAM, R. P. (1954). **The mating and whelping of dogs.** pp. 162. London: Popular Dogs Publishing Co., Ltd. 7s. 6d. 560

This little book, written mainly for novice dog breeders, contains, apart from a brief description of the reproductive organs and the physiology of reproduction, some hints of value on the management of mating and whelping. There are six illustrations.—E.G.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

- ASRATYAN, E. A. (1953). **I. P. Pavlov: his life and work.** pp. 164. Moscow: Foreign Languages Publishing House. (London: Collet's Holdings Ltd.) 3s. 6d. [In English.]

- BURROWS, W. (1954). **Textbook of microbiology.** pp. xix+824. Philadelphia (& London): W. B. Saunders Co. 16th Edit. 55s.

- CAIN, A. J. (1954). **Animal species and their evolution.** pp. ix+11-190. London (& New York, Toronto, Melbourne, Sydney, Cape Town): Hutchinson's University Library. 8s. 6d.

- CHOPRA, R. N., BADHWAR, R. L. & GHOSH, S. (1949). **Poisonous plants of India.** pp. liv+762. Delhi: Manager of Publications. The Indian Council of Agricultural Research. Scientific Monograph No. 17. Rs. 30.0 or 46 sh.

- DOBBERSTEIN, J., FREI, W., HEMMERT-HALSWICK, A & HJÄRRE, A. (1955). **Allgemeine Pathologie für Tierärzte und Studierende der Tiermedizin. [General veterinary pathology.]** pp. viii+345. Berlin & Hamburg: Paul Parey. 4th revised edit. DM 30.

- DOEHNER, H. (1954). **Handbuch der Schafzucht und Schafhaltung. Band IV. Die Leistungen des Schafes. Wolle, Fleisch, Milch, Leder, Dung. [Sheep breeding and husbandry. Vol. IV.]** pp. xiv+670. Berlin & Hamburg: Paul Parey.

- HALDANE, J. B. S. (1954). **Biochemistry of genetics.** pp. 144. London: George Allen & Unwin, Ltd. 15s.

- KAUFFMANN, F. (1954). **Enterobacteriaceae. Collected studies on Salmonella, Arizona, Escherichia (including Alkalescens-Dispar and**

- Bethesda - Ballerup*), *Klebsiella*, *Cloaca*, *Hafnia*, *Shigella*, *Proteus* and *Providencia*. pp. 382. Copenhagen: Ejnar Munksgaard. 2nd Edit. [In English.]
- LEUPOLD, E. (1954). Die Bedeutung des Blutchemismus besonders in Beziehung zu Tumorbildung und Tumorabbau. [Importance of blood chemistry, particularly in relation to tumour formation and tumour destruction.] pp. 207. Stuttgart: Georg Thieme. DM 48.
- LIPP, W. (1954). Histochemische Methoden. Lieferung I-IV. [Histochemical methods. Parts I-IV.] pp. 24 each part. München: R. Oldenbourg.
- LOVERN, J. A. (1955). *The chemistry of lipids of biochemical significance*. pp. xiii+132. London: Methuen & Co. Ltd. (New York: John Wiley & Sons, Inc.). 8s. 6d.
- MACKIE, T. T., HUNTER, G. W. & WORTH, C. B. (1954). *A manual of tropical medicine*. pp. xxii+907. Philadelphia (& London): W. B. Saunders Co. 2nd Edit. 60s.
- MÜLLER, B. (1953). Die Parasitischen Würmer. Ihre Biologie und Bekämpfung. Teil 1. Rundwürmer (*Nematoda*). [Parasitic nematodes. Biology and control.] pp. 47. Wittenberg/Lutherstadt: A. Ziemsen. DM 1.50.
- PAPANICOLAOU, G. N. (1954). *Atlas of exfoliative cytology*. pp. xvi+56, + plates and index pages. New York: Harvard University Press (London: Geoffrey Cumberlege, Oxford University Press). 144s.
- PRIER, J. E. (1953). *Turkey diseases*. pp. 151. Danville, Ill.: Interstate Publishers. 20s.
- SCHLEITER, H. (1953). Klauenpflege beim Rind. Leitfaden für Klauenpfleger und Landwirte. [Trimming the hooves of cattle.] pp. 46. Leipzig: S. Hirzel. DM 3.30.
- THOMAS, E. W. C. (1954). *A synopsis of forensic medicine and toxicology*. pp. viii+180. Bristol: John Wright & Sons, Ltd. 3rd Edit. 12s. 6d.
- WAY, R. F. (1954). *The anatomy of the bovine foot: a pictorial approach*. pp. 58. Philadelphia, Pa.: University of Pennsylvania Press. (London: Geoffrey Cumberlege, Oxford University Press.) 32s.
- WRIGHT, G. P. (1954). *An introduction to pathology*. pp. xii+636. London (New York & Toronto): Longmans Green & Co. 2nd Edit. 40s.
- (1954). *Renal function*. Transactions of the Fifth Conference, October 14, 15 and 16, 1953, Princeton, N.J. [Sponsored by the Josiah Macy, Jr. Foundation.] [Edited by: BRADLEY, S. E.] pp. 218. New York: Josiah Macy, Jr. Foundation. \$3.75.
- (1954). *Annual review of microbiology*. Vol. VIII. [Edited by: CLIFTON, C. E., RAFFEL, S. & STANIER, R. Y.] pp. 536. Stanford, Calif.: Annual Reviews Inc. (London: H. K. Lewis & Co., Ltd.) \$7.00.
- (1954). *Serological approaches to studies of protein structure and metabolism*. [Edited by: COLE, W. H.] pp. 97. New Brunswick, N.J.: Rutgers University Press. \$2.00.
- (1954). *The application of results of research*. [Compiled and Edited by: CONNELL, V.] pp. vii+212. London: Butterworths Scientific Publications. 21s.
- (1954). Fortschritte der Allergielehre. IV. [Progress in allergy. Vol. IV.] [Edited by: KALLÓS, P.] pp. 520. Basle (& New York): S. Karger. Swiss Fr. 68.65. [In English.]
- (1954). *Peripheral nerve injuries, by the Nerve Injuries Committee of the Medical Research Council*. [Edited by: SEDDON, H. J.] pp. xvi+451. London: H.M. Stat. Off. Spec. Rep. Ser. med. Res. Coun. Lond. No. 282. 55s.
- (1954). *Methods in medical research*. Vol. VI. [Edited by: STEELE, J. M.] pp. xiii+271. Chicago, Ill.: The Year Book Publishers, Inc. \$7.
- (1954). *Recent developments in psychosomatic medicine*. [Edited by: WITKOWER, E. D. & CLEGHORN, R. A.] pp. xvi+495. London: Sir Isaac Pitman & Sons, Ltd. 50s.
- (1954). *British Pharmaceutical Codex 1954*. pp. xxxii+1340. London: The Pharmaceutical Press. 63s.

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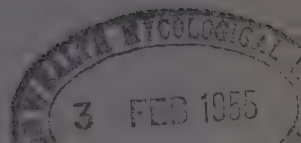
THE VETERINARY BULLETIN

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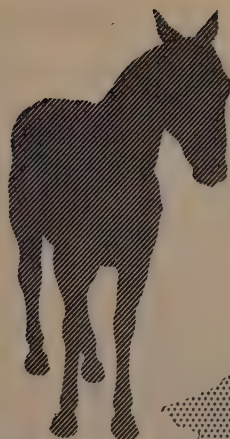
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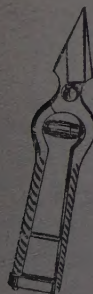
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